



FRIDAY, DECEMBER 5.

## Train Accidents in October.

The following accidents are included in our record for the month of October:

## COLLISIONS.

## REAR.

1st, a. m., special passenger train on Chicago, Burlington & Quincy ran into some cars left standing on main track at Hughson, Ia., doing some damage.

1st, noon, passenger train on New Haven & Northampton ran over a misplaced switch and into freight train standing on siding in Westfield, Mass. Both engines and four cars damaged and a trainman hurt.

1st, p. m., engine on Boston & Providence ran into the rear of passenger train being backed into the yard at Boston. The rear car was upset and damaged.

3d, night, express freight train on Central Pacific ran into the rear of way freight near Port Costa, Cal. Engine and seven cars badly damaged.

4th, p. m., passenger train on the Delaware & Hudson Canal Co.'s road ran into switching freight in Albany, N. Y., doing some damage.

5th, p. m., wild engine on New York, West Shore & Buffalo ran into rear of freight going into siding at Amboy, N. Y. Engine and three cars badly damaged, engineer and fireman hurt.

6th, evening, passenger train on Michigan Central ran over misplaced switch in Buffalo, N. Y., and into yard engine standing on siding. Both engines damaged and engineer hurt.

7th, p. m., freight train on New York, Pennsylvania & Ohio broke in two near Warren, O., and rear section ran into forward one, wrecking several cars. One of the cars contained a quantity of explosives which were set off by the concussion, and eight cars were turned up.

8th, p. m., freight train on Cincinnati, Wabash & Michigan ran into construction train near Wabash, Ind., wrecking an engine and a number of cars.

9th, a. m., passenger train on the Memphis & Charleston road ran into some box cars run out of a siding on the main line at Bailey, Tenn., probably by wind. Engine and several cars badly wrecked, engineer, fireman and express messenger much hurt.

10th, a. m., freight train on Missouri, Kansas & Texas ran into preceding freight near Aubrey, Tex., wrecking several cars. A stockman in caboose was fatally hurt.

12th, a. m., freight train on Chicago & Northwestern ran into rear of preceding freight stopped by signal near Cedar Rapids, Ia. The first freight sent back a signal, but there was a dense fog at the time, and it was not seen.

12th, a. m., extra train of empty passenger cars on New York, West Shore & Buffalo ran into a repair train standing on track near Orangeburg, N. Y. An engine and several cars were badly damaged and a trainman hurt. The repair train had a flag out, but flagman did not go far enough.

13th, a. m., passenger train on Amboy Division, Pennsylvania Railroad, ran over misplaced switch and into West Jersey passenger train going into the yard in Camden, N. J., on the adjoining track. The engines were thrown together and both wrecked, an engineer killed, a fireman badly hurt, and four passengers less severely injured.

15th, night, passenger train on Canada Southern Division, Michigan Central, ran into rear of gravel train pulling out from siding at Tilbury Centre, Ont. The engine of passenger train damaged and two cars thrown into the ditch. Engineer killed and four passengers hurt.

16th, evening, special passenger train on Chicago, Burlington & Quincy ran into rear of freight train near Biggsville, Ia., damaging several cars.

17th, evening, as passenger train on Pennsylvania Railroad was being switched at the Union Station in Pittsburgh, Pa., one Pullman car was run into another with great violence, shaking up passengers, extinguishing lamps and smashing crockery in buffet.

17th, evening, passenger train on Chicago, Rock Island & Pacific ran into switching freight in Rock Island, Ill., damaging cars.

18th, p. m., freight train on Philadelphia & Reading ran into rear of local passenger train at Exeter, Pa. A car was wrecked, one passenger killed and five others hurt.

19th, noon, freight train on New York, Lake Erie & Western ran over misplaced switch and into cars on a siding in Hornellsville, N. Y. Engine and 19 cars were piled up in a bad wreck. Engineer and brakeman hurt.

22d, evening, freight train on Shenandoah Valley road ran into preceding freight stopped at Kimball, Va., wrecking engine and several cars and killing engineer.

23d, night, passenger train on Grand Trunk ran into freight at Point Claire, Que., which had gone on a siding but left a car projecting over on the main track. Engine and several cars wrecked, the engineer killed, fireman severely hurt and nine passengers slightly injured.

23d, a. m., passenger train on Atchison, Topeka & Santa Fe ran into rear of freight at Wakarusa, Kan., damaging engine and several cars and injuring engineer.

26th, a. m., coal train on New York, Lake Erie & Western ran into freight stopped at Attica, N. Y. Engine and 28 cars were piled up in a bad wreck.

26th, night, freight train on Canada Southern Division, Michigan Central, ran over misplaced switch at Montrose, Ont., and into freight standing on a siding. The caboose was wrecked and caught fire, one trainman burned to death and another badly hurt.

27th, very early, freight train on Wabash, St. Louis & Pacific ran into preceding freight near Taylorville, Ill., wrecking car loaded with Italian laborers attached to the first freight; 14 Italians injured, some of them very badly.

27th, very early, freight train on Delaware, Lackawanna & Western ran into preceding freight near Owego, N. Y., which had stopped for water, but sent out no signal.

27th, a. m., passenger train on Chicago & Northwestern ran into freight just going into siding at West Bend, Wis. Engine and several cars wrecked.

27th, noon, freight train on Pennsylvania Railroad ran into work train standing at Gallatin, Pa., wrecking several cars and injuring four laborers.

## BUTTING.

2d, a. m., butting collision between two freight trains on New York, Pennsylvania & Ohio near Galion, O., damaging both engines and injuring two trainmen.

3d, a. m., freight train on Louisville & Nashville broke in two near Woodlawn, Tenn., and rear section ran backward

down grade and into following passenger train. The engine and several cars were wrecked.

5th, night, butting collision between passenger and freight train on Chesapeake & Ohio near Catlettsburg, Ky. Both engines somewhat damaged, and two trainmen slightly hurt.

6th, p. m., butting collision between passenger and freight train on Chicago, Rock Island & Pacific near Commerce Mills, Ia. Both engines were damaged and two trainmen hurt. The freight was trying to make a siding to pass the passenger train, but was behind time and failed to do so.

8th, noon, butting collision on Union Pacific, near Elkhorn, Neb., between freight train and wild engine. Both engines and four cars badly wrecked, engineer and fireman killed and another fireman hurt.

11th, a. m., butting collision between two freight trains on Grand Trunk near London, Ont. Both engines and several cars wrecked. It is said that one of the trains left London without orders.

11th, night, butting collision between two freight trains on Chicago & Northwestern, near Cedar Rapids, Ia.; both engines and a number of cars damaged. It is supposed to have been caused by a mistake in orders on the part of a conductor.

12th, a. m., butting collision between coke train and freight train on Pennsylvania Railroad, near Hunter, Pa. Both engines badly wrecked, brakeman killed and three other trainmen hurt. Wreck caught fire and burned for a long time, it being impossible to put out the coke, which made a very hot fire.

13th, a. m., butting collision between two freight trains on Kentucky Central near De Courcy, Ky.; both trains wrecked, three trainmen badly hurt. Collision caused by mistake in giving orders.

15th, p. m., butting collision between work train and wild engine on Union Pacific near Brady Island, Neb. Engine of work train was slightly damaged.

The light engine, which had been reversed before the engine jumped, started off backwards and soon attained a very high speed, and after passing Plum Creek station ran into freight train coming eastward with two engines. All three engines were wrecked, a number of cars damaged and one trainman hurt.

16th, a. m., butting collision between wild engine and freight train on Union Pacific, near Green River, Wyo.; both engines damaged, one trainman killed and another hurt.

19th, night, butting collision between passenger and a freight train on Baltimore & Ohio, near Crouch's, Pa.; both engines damaged and road blocked several hours.

23d, p. m., butting collision between two freight trains on New Haven & Northampton, near Holyoke, Mass.; both engines and several cars damaged.

25th, early, freight train on Philadelphia & Reading ran over a misplaced switch and into the head of a coal train coming up on the opposite track. Both engines and 30 cars were piled up in a bad wreck.

## CROSSING.

1st, p. m., freight train on Indiana, Bloomington & Western ran into Illinois Central freight at crossing in Champaign, Ill.; engine and three cars badly damaged.

3d, a. m., passenger train on Philadelphia, Wilmington & Baltimore ran into Delaware & Chesapeake passenger train pulling across the track at Norton, Del.; three cars upset and three passengers slightly hurt.

10th, p. m., freight train on Chicago, St. Louis & Pittsburgh ran into a freight on Belt road at crossing in Chicago. Five refrigerator cars thrown from the track; wreck caught fire and was destroyed.

30th, evening, freight train on Burlington & Missouri River ran into Union Pacific train at crossing in Grand Island, Neb. Union Pacific engine upset, engineer and fireman slightly hurt.

## DERAILMENTS.

## BROKEN RAIL.

5th, a. m., four cars of freight train on Northern Pacific thrown from the track at Hawley, Minn., by a broken rail. A tramp stealing a ride badly hurt.

20th, a. m., engine of freight train on Wabash, St. Louis & Pacific was thrown from track near Marysville, Mo., by a broken rail.

25th, night, freight train on Northern Pacific struck broken rail near Spokane Falls, W. T., and 30 cars were thrown from the track.

## BROKEN FROG.

17th, a. m., engine and 10 cars of freight on Philadelphia & Reading thrown from track near Reading, Pa., by broken frog; engineer badly hurt.

## BROKEN SWITCH-ROD.

18th, early, passenger train on Louisville, New Albany & Chicago was thrown from track at Putnamsville, Ind., by broken switch-rod. The engine and three cars went down bank some 10 ft. and cars upset. The engineer, express messenger and baggage man badly hurt; five passengers were slightly bruised.

20th, p. m., engine and two cars of freight train on Boston & Lowell were thrown from the track at Winchester, Mass., by broken switch-rod.

## BROKEN BRIDGE.

17th, evening, bridge on Cincinnati & Eastern, near East York, O., gave way under passenger train, and the engine, baggage and one passenger car fell some 50 ft. into the river. Engineer, fireman and two passengers killed, two trainmen and four passengers badly hurt, and 33 others less severely injured. The bridge was under repairs at the time; it was considered safe, as several freight trains had passed over it during the day without accident.

25th, night, passenger train on St. Paul, Minneapolis & Manitoba ran upon small wooden bridge near Crookston, Minn., which had been partially burned. The engine passed over, but three cars went through the bridge and were damaged.

29th, a. m., freight train on Wabash, St. Louis & Pacific broke through bridge near Maryville, Mo.; engine and three cars went down, engineer killed.

## SPREADING OF RAILS.

5th, a. m., several cars of freight train on Gulf, Colorado & Santa Fe were thrown from the track near Caldwell, Tex., by the spreading of the rails.

31st, midnight, freight train on Burlington & Missouri River was thrown from the track in Omaha, Neb., by the spreading of the rails. The engine upset down a bank, killing engineer and fireman.

## BROKEN WHEEL.

24th, a. m., 10 cars of freight train on New York, Pennsylvania & Ohio thrown from the track near Bear Lake, Pa., by broken wheel.

## BROKEN AXLE.

7th, a. m., tender and eight cars of freight train on the New York, Lake Erie & Western were thrown from the track near Mahwah, N. J., by the breaking of an axle under the tender.

## BROKEN DRAW-HEAD.

15th, a. m., freight train on Chicago, Milwaukee & St. Paul broke in two near Ridgewood, Wis., and eight cars were thrown from the track by the draw-head falling on the rails. A brakeman was caught between the cars and killed.

## ACCIDENTAL OBSTRUCTION.

26th, a. m., several cars of freight train on New York Central & Hudson River were thrown from the track at Weedsport, N. Y., by a broken brake-beam falling on the rails.

30th, night, freight train on Cleveland & Pittsburgh struck a wagon at a road-crossing in Cleveland, O., and the engine and four cars were thrown from the track. A brakeman was hurt, and the driver of the wagon killed.

31st, night, several cars of freight train on St. Johnsbury & Lake Champlain were thrown from track near Johnson, Vt., by some wheels which fell from a freight car on which they had been loaded.

## CATTLE.

1st, a. m., freight train on Texas & Pacific ran over horse near Plaquemines, La.; engine and four cars were thrown from track. The fireman was scalded to death.

5th, a. m., passenger train on Mobile & Northwestern ran over cow near Clarksdale, Miss., and the engine was thrown from the track, injuring the engineer and fireman.

14th, early, freight train on Pennsylvania Railroad ran over a cow near Bradford, Pa.; engine and eight cars were thrown from track and piled up in a bad wreck. A fireman was killed and a brakeman badly hurt.

## WASH-OUT.

1st, evening, passenger train on Kansas City, Ft. Scott & Gulf ran into wash-out near Parsons, Kan.; the engine was wrecked.

2d, p. m., construction train on Chicago, St. Paul, Minneapolis & Omaha ran into wash-out at Pike's Creek, Wis. The engine and tender went down into the gap. A large number of laborers were riding on the tender; two were killed and seven others so badly injured that they died within a few days, and 14 more were less severely hurt. The train was on its way to repair one wash-out, but it ran into another.

5th, a. m., freight train on Northern Pacific ran into wash-out at Fond du Lac, Minn.; locomotive and eight cars were thrown into St. Louis River. The engineer, fireman and a brakeman went into the river with the engine and were drowned.

## MISPLACED SWITCH.

2d, a. m., passenger train on Boston, Hooac Tunnel & Western was thrown from track at Mechanicsville, N. Y., by misplaced switch.

5th, midnight, engine on Philadelphia & Reading was thrown from track near Reading, Pa., by misplaced switch. The engine upset, injuring two trainmen seriously.

7th, p. m., freight train on Boston & Albany was thrown from the track by misplaced switch at Wellington, Mass., and the engine and 14 cars were thrown from the track. Some of the cars struck a house standing close by and knocked out one corner of it.

12th, night, passenger train on New York, Lake Erie & Western was thrown from track in Buffalo, N. Y., by a misplaced switch.

13th, night, engine of freight train on Philadelphia, Wilmington & Baltimore was thrown from track near Lamoikin, Pa., by a misplaced switch.

15th, noon, freight on Western & Atlantic road was thrown from track in Atlanta, Ga., by misplaced switch; brakeman was slightly hurt.

18th, a. m., engine of freight train on Wabash, St. Louis & Pacific was thrown from track in Prevoist, Ill., by misplaced switch.

27th, evening, passenger train on New York, Lake Erie & Western was thrown from track at Sterling Junction, N. Y., by misplaced switch. The engine upset, injuring engineer and fireman.

29th, evening, passenger train on New York, Susquehanna & Western was thrown from track at Franklin Furnace, N. J., by misplaced switch. The engine was thrown over against a couple of loaded ore-cars and badly damaged.

30th, a. m., engine of passenger train on New York, Lake Erie & Western was thrown from track in Paterson, N. J., by a misplaced switch.

## MALICIOUS.

2d, night, engine and four cars of freight train on Chicago, Burlington & Quincy were thrown from track at Sheridan, Ill., by a switch purposely misplaced.

5th, a. m., freight train on Atchison, Topeka & Santa Fe was thrown from track near Emporia, Kas., by two rails unfastened but left in place. The spikes and fish-plates had been removed, it is supposed for the purpose of derailing a passenger train and robbing it.

6th, night, locomotive of freight train on Eastern Railroad was thrown from track near Lynnfield, Mass., by some ties piled up on track, it is supposed by tramps.

17th, evening, passenger train on Boston & Albany, was thrown from track at Nigger Hollow, near Kiudeshook, N. Y., where a rail had been misplaced and bolted down and the track further obstructed by ties piled upon it. The engine was thrown into a sand bank with the baggage car on top of it, and the express car thrown clear over the engine. The engineer was so injured that he died next day. Three trainmen and one passenger were badly hurt. The point where the accident occurred was on a high bank. A man living in the neighborhood was subsequently arrested on suspicion, but has not yet been tried.

17th, night, passenger train on Mobile & Ohio was thrown from the track near Tupelo, Miss., where a rail had been removed from the track with the intention of wrecking the train. Five passengers were seriously injured, two passengers and three trainmen slightly hurt.

31st, a. m., freight train on Ohio & Mississippi was thrown from the track, near Cowden, Ill., by ties piled up on the rails; engine and four cars wrecked, fireman killed, engineer and a brakeman badly hurt.

## UNEXPLAINED.

3d, night, some cars of a gravel train on Boston & Providence ran off the track near Mansfield, Mass., and 80 cars were piled up on a road-crossing, wrecking a flagman's house and very badly injuring the flagman and a man who was sitting in his house.

4th, a. m., car in a circus train on Providence & Worcester was thrown from track at Manville, R. I., doing some damage.

6th, evening, engine of passenger train on Allegheny Valley road ran off the track in Pittsburgh, Pa., and was thrown across both tracks.

11th, night, three cars of freight train on Northern Pacific were thrown from track near Glyndon, Minn., and badly wrecked; a trainman was hurt.

12th, p. m., as freight train on Louisville & Nashville was being hauled up the incline from the ferry transfer at Henderson, Ky., five cars jumped the track and were badly wrecked. A brakeman was fatally hurt and another less severely injured.

15th, a. m., line of caboose cars being switched near Union Station in Pittsburgh, Pa., from Pennsylvania to the Pitts-



burgh, Cincinnati & St. Louis track, several cars were thrown across the track, doing some damage and causing some delay to trains.

20th, p. m., freight train on Central Railroad, of Georgia, ran off the track in Macon, Ga., causing some delay to trains.

21st, a. m., freight train on South Florida road ran off the track near Kissimmee, Fla., blocking the road a short time.

21st, p. m., freight train on Wabash, St. Louis & Pacific ran off the track in Hannibal, Mo., blocking the yard.

22d, p. m., engine of extra passenger train on Richmond & Danville was thrown from the track in Raleigh, N. C. The train was very much crowded with passengers returning from the state fair, and a man who was standing on the platform was thrown between two of the cars and killed.

22d, evening, coal train on New York, Lake Erie & Western was thrown from the track near Lackawaxen, Pa., and 14 cars were wrecked.

24th, a. m., freight train on Louisville & Nashville ran off the track near Montgomery, Ala., blocking the road several hours.

25th, a. m., three cars of freight train on Northern Pacific were thrown from track in Ainsworth, W. T. A brakeman was slightly hurt.

26th, evening, a car of a passenger train, New York, West Shore & Buffalo, jumped the track at Genesee Junction, N. Y., upset and rolled over into the old canal bed.

29th, a. m., an engine and two ore cars ran off the track on a trestle on Wilmington & Northern in Reading, Pa., and fell some 15 ft. The engine crashed into the boiler house of the Reading Iron Works. The engineer and fireman were hurt.

#### OTHER ACCIDENTS.

#### BOILER EXPLOSIONS.

29th, a. m., engine of freight train on Baltimore & Ohio exploded its boiler just as the train was starting out of the yard at Locust Point, Baltimore. The engine was completely wrecked, the engineer and fireman killed.

#### MISCELLANEOUS.

14th, a. m., the mail car of passenger train on Chicago, St. Paul, Minneapolis & Omaha caught fire near New Richmond, Wis., and was entirely destroyed. The car is said to have been fired by sparks from the engine falling into a lot of campaign torches in a compartment loaded with express matter.

26th, early, as a passenger train on the New York, Lake Erie & Western road was passing a freight train on the double track near Pine Grove, Pa., a door on one of the freight cars swung loose and struck the forward end on a passenger car, wrecking one side of the car and smashing every window in it.

#### SUMMARY.

This is a total of 105 accidents, in which 39 persons were killed and 170 hurt. As compared with October, 1883, there is a decrease of 68 accidents, of 4 killed and of 61 injured. A fuller statement of the totals and averages will be found on another page.

The ten months of the current year to the end of October show a total of 990 accidents, 338 killed and 1,521 injured; a monthly average of 99 accidents, 34 killed and 152 hurt, and a daily average of 3.25 accidents, 1.11 killed and 4.99 injured.

#### The Standard Car Heater.

The objections to and danger of having stoves located in the inside of the cars are well known, and have been demonstrated, by numerous terrible accidents in which scores of persons were burned to death. Ordinary stoves are not only dangerous, but usually occupy the space of two double seats.

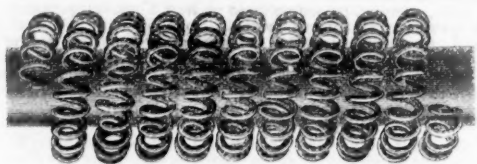


Fig. 1.

If a car seats 60 passengers and costs \$4,500, each seat is worth \$75, and the space taken up by the stove is therefore worth \$300. Ordinary stoves make the seats nearest to them very uncomfortable, heat the car very unequally, injure the woodwork and create much dirt and dust.

Some recent forms of heaters have therefore been placed beneath the car body, and the heater lately introduced by the Standard Car Heating & Ventilating Co., of Pittsburgh, is of this class. In order to avoid overheating the air in the car, and its consequent injurious and k'n. drying effects, the air is heated by contact with steam pipes, as steam of a given pressure, in contact with water will never exceed a given temperature. Low-pressure steam is generated in the heater below the floor, and conducted into suitable coils of pipe on the inside of the car, over and around which the supply of fresh, cold air is made to circulate before it escapes into the car.

The radiating surface of the steam pipes is increased 250 per cent. by the use of Gold's "compound coil radiator," for warming the supply of air. This radiator consists of ordinary wrought iron pipes, around which coils of wire are wound, as shown in fig. 1. A radiator composed of pipes of this description is placed at each end of the car, and is inclosed in a suitable case, so that the cold air, which is conducted by a pipe from the roof into this case, must circulate around the radiator and is thus warmed, and is then delivered into the car by suitable registers.

Fig. 2 represents a section through the centre of the heater and boiler, crosswise to the car. The boiler, A, consists of a hemispherical shaped vessel with a convex top, a form which cannot be injured by frost and is easily and cheaply made. It holds ten gallons and is tested to 180 lbs. pressure per square inch. The fire-pot is immediately below the boiler, and both are surrounded with a casing, B c, consisting of a double sheet-iron cylinder, which surrounds the whole heater, and is filled with mineral wool and asbestos cement packing, which acts as a non-conductor.

The fire is fed by two inclined coal chutes, which extend outward to the outside of the car. These are clearly shown in Fig. 2, and also at C c, in fig. 3, a perspective view

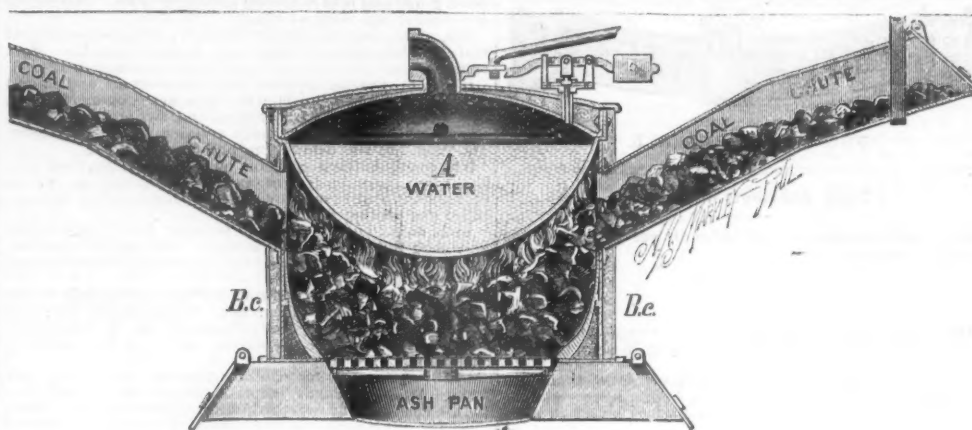


Fig. 2.

showing the heater from one side of the car. The chutes are inclined and made smooth inside, so that the motion of the car will feed the fire continuously so long as the chutes have any coal in them; (About 20 hours with anthracite coal). Their action is similar to that of an ordinary base-burning stove.

In fig. 3, C b is the coal box and S p the smoke pipe. The latter has an outside casing with an intervening space of  $\frac{3}{4}$

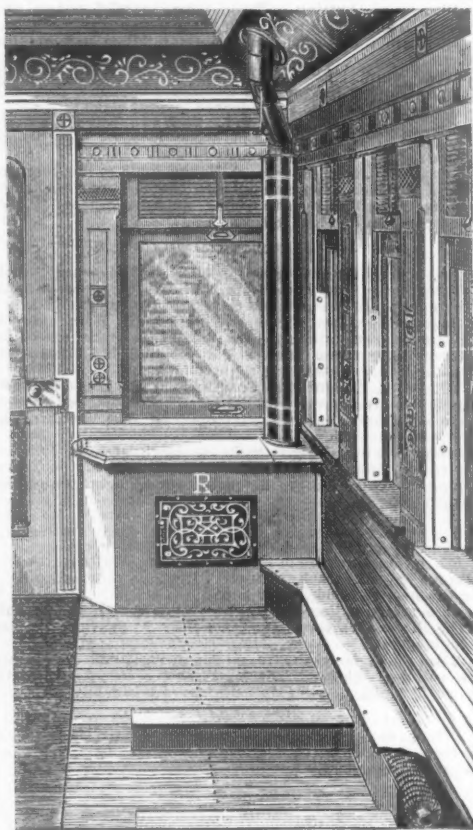


Fig. 4.

in. between it and the smoke pipe proper. This space is filled with plaster of paris, the best non-conducting material to protect the car body from the heat of the pipe. A shield consisting of two zinc plates with an air space between them is also placed between the car and the smoke pipe. The latter is conducted from the heater underneath the car body, along the truss plank, to a point near the end of the car, where it may be carried to the roof by extending it up through the closet or in the corner of the car. If carried through the water-closet, it affords a means of ventilating that apartment. The pipe on the inside of the car is also protected by double pipes, with intervening spaces, as already described. A suitable hood, ordinarily a globe ventilator, is placed on top of this smoke pipe.

If steam of a given pressure is used for heating, it is essential to regulate the fire to that pressure, so as to avoid blowing off steam, and at the same time prevent the pressure from falling too low. In an apparatus for heating cars this regulation to be entirely effective must be automatic and regulate itself.

In the standard car-heater, a device is used for this purpose, consisting of a lever W X, fig. 3, which is pivoted to a fixed fulcrum at a. It is weighted at its outer end W, and is connected by the other end to a damper at R. The short post V bears on a diaphragm, the lower side of which is exposed to the steam pressure of the boiler. When the steam pressure is lowered, the diaphragm is depressed by the weight W, and the opposite end of the lever is raised, which is connected by the rod X R, and the short crank R, to a or a damper inside of the air box R. By this means communication is opened from the aperture at D o with the pipe which communicates with the ash-pan, by which air is admitted to the fire. The fire is consequently stimulated and the steam pressure increased. When the pressure reaches

or goes above the maximum limit, the weight W is raised, the end X of the lever is depressed, and the damper is moved, so as to partially close the communication from D o with the ash pan, and open it between D o and the top of the fire. By this means cold air is admitted above the fire and the steam pressure is thus lowered and regulated so that it is maintained very nearly at a uniform point.

The temperature of the air in the car also needs to be regulated. A car heater must be capable of just "taking the chill away" from a car on a cool morning or evening, and must also be able to heat it when the thermometer is down below zero, with a violent "blizzard" blowing. This, of course, makes a great range of heating capacity requisite. The steam pipes are arranged in coils at the end of the car, inside the box R, fig. 4. Another pipe is carried along on each side of the car, just above the floor, along the truss-plank. The supply-pipe for admitting air to the steam coils has a hood on top, which is placed above the roof of the car and is shown in section in fig. 5. This hood has an opening at each end, covered with wire netting for the admission of

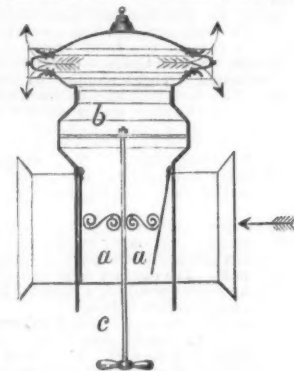


Fig. 5.

air. It also has two valves, a a, which are hinged at their upper edges, and which cover openings for the admission of air. The air pressure, when the car is moving, will open one of these valves and close the other. Air is thus forced down the supply pipe, over and around the coils of steam pipe, and is delivered into the car warmed. If the passengers should become too warm, and the air supply is shut off, then, obviously, the amount of heat communicated to the car would be diminished; but the coils of steam pipe would still remain, and would radiate a very considerable amount of heat. To make still further regulation possible, a globe exhaust-ventilator is placed on top of the hood, and communicates with the hood by apertures at b, fig. 5, which are closed by a revolving register. The rod c is connected with this register, and also has two curved arms, opposite to the valves a a. When the rod c is turned a quarter turn by means of the handle at its lower end, the two arms referred to close the valves a a and open the register b, thus shutting off the supply of fresh air which enters the hood and opening communication between the air supply pipe and the globe ventilator on top. The result is that the latter exhausts the air from the supply pipe and from the casing which surrounds the steam coils. In fig. 4, a register, R, is shown in the casing, which, if opened, would then permit the air to be exhausted from the car. Air would also be exhausted from the small openings in the casing which covers the pipes along the floor of the car. It is obvious then, that with this arrangement, warmed air may either be admitted to the car, or the supply may be entirely shut off, and the apparatus can be employed to exhaust air from the car. In this way a very wide range of heating capacity is available, sufficient to warm the car comfortably in the coldest weather, or do it without discomfort when it is so mild as to make artificial heat unnecessary.

#### Uses for Anthracite Coal Dust.

At a meeting of the Scranton Board of Trade held recently an address was delivered by Col. J. A. Price, on the utilization of cull or coal waste. Col. Price referred to the increasing use of the smaller sizes of anthracite coal, much of which had previously been wasted, and said that there was still an enormous amount of waste in the form of cull or fine dust. He believed that means would be found to use this fuel hereafter, especially as it was theoretically the best form of fuel, being carbon in a state of fine division, and therefore capable of the most complete combustion. He was satisfied from experiments already made with very imperfect ap



paratus that the use of this fine coal or dust in furnaces was not only a possible, but a highly probable attainment. The introduction of the fuel into the furnace by a proper method of stoking, with arrangements for the best possible supply of oxygen by some process which must be automatic and continuous, would solve the problem. The difficulties remaining were purely mechanical, and he had no doubt that they would be long removed.

Col. Price also referred at considerable length to the possible use of this coal dust or waste as a fertilizer. Experiments made on light soils had proved that its use for this purpose would be beneficial, and further experiments were to be made with a view of ascertaining the best possible manner in which to use it. The opening of a market for the immense amount of coal dust now piled up in the anthracite region, to which additions are daily being made, would be of almost incalculable benefit to that region.

He asked that the Board of Trade take measures at once to procure the aid of the state in making further investigations and improvements, the method indicated being the appointment of a state commission upon the question.

### Contributions.

#### Maps of Railroad Surveys.

MONROE, Wis., Nov. 24, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The proper scale for railroad maps depends upon several circumstances.

The first and most important is the character of the country, whether rough or smooth. One of the engineers of the Vermont Central made his maps on a scale of 500 ft. per inch, which seemed large enough. In Wisconsin and Minnesota such maps are usually considered too large, and many roads have been built using scales of 800 and 1,000 ft. per inch. In Dakota even those scales are unnecessarily large.

In Dakota and Montana, on the Northern Pacific, the scale used was 800 ft. per inch, but on the rougher portion 400 was used. In so rough a state as Pennsylvania I should pre-

per inch he should by all means have it; but for efficiency in work, the man who is least dependent upon maps has the greatest advantage.

J. T. DODGE.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issues of the 7th and 14th inst. you have articles on the scales of railroad maps.

The engineer who submitted the Atlanta map worked on the rule of the Indian missionary, "poor pay, poor preach." We all know that for short local lines maps or plans are not required, the sectional profile with quantities being furnished for the information of contractors who design bidding on the work.

Of course, on a railroad with a competent chief engineer and parties in charge of expert assistants, maps drawn to a scale suitable to the purposes of the map are always furnished.

For 30 years I have used three scales, viz.:

General map, 100,000; contours, 20 ft.

Preliminary map, 50,000; contours, 5 ft.

Map of location, 25,000; contours, 2½ ft.

I have found these maps to answer every purpose in the United States and in the Sierra Madre of Mexico.

The retention, or ratio, of the graphical scale to the natural plan will control our selection. For if 1/100 of an inch is the limit of vision for a line drawn on the map, all objects which are indispensable to a proper use of the map must be included in the details according to a scale which will permit the objects to be recognized on the map. On the other hand, a sheet of paper which is to be transported with tents and used on a camp-table is limited in size, and must represent a reasonable amount of country. These are, then, the limits of your map, and determine the scale. When expressed fractionally, as 50,000, the numerator is value of a given line on the map to value on the ground, whether in inches, feet, metres or miles. Thus one foot on the map represents 5,000

always in a state of change during construction, when a few cross sections run out from the preliminary would have enabled the engineer to put the location in the proper place at first. If the lines are too far apart for this, the second partakes more of the nature of another preliminary than a location. One always loses time by the "cut and try" method.

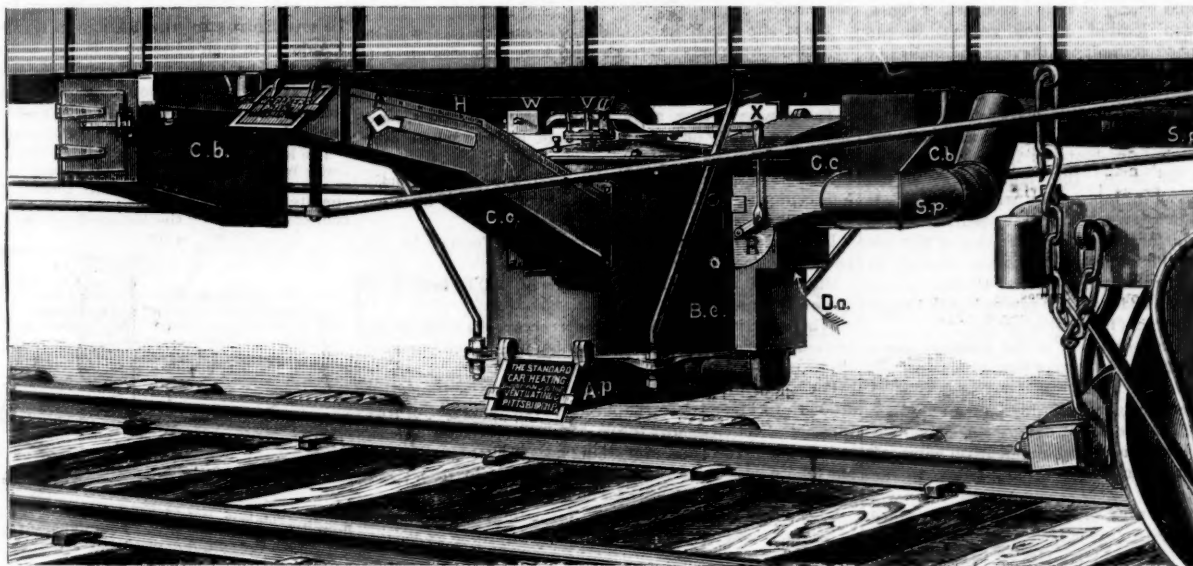
In my opinion, a careful reconnaissance with barometer and pocket compass, together with a study of the best existing maps, should be sufficient to show the general direction of any proposed through or local line, not over 20 or 30 miles in length; so that if the engineer in charge of the party does considerable tramping ahead of his men, one preliminary will generally be sufficient.

From the topographer's notes it can be seen where the line requires to be plotted on a large scale, and the preliminary sheets can be so drawn at once. 100 ft. per inch is a good scale for rough ground, and 400 ft. per inch is suitable for level country, in woods, or where farms are not less than 300 ft. wide; in towns, use 50 ft. per inch.

The 19 in. x 24 in. sheets are, no doubt, very convenient, and I shall use them in future.

Contour lines are not generally required for the purpose of fixing the location on the preliminary plans. Plus or minus figures to the nearest foot, placed on the preliminary plan at the points where taken, are sufficient; plus signifying that ground is so many feet higher than surface height at station opposite which it is placed, and minus sign that it is so much lower. On steep hill sides, where figures would crowd, contours might be used.

Far too little care is generally taken in running the trial line; it pays to explore the ground well, and have a cross section man with hand level and 16 ft. light pine leveling rod, to take cross sections at every one, two, or three stations, according to the character of the ground, extending out from one to 500 ft., or more.



THE STANDARD CAR HEATER.—Fig. 3.

er a scale not larger than 400 ft., except in villages and cities, where 200 and 100 would suit.

The next consideration is the use for which the maps are made. If for men who are not to see the ground and who are to derive their knowledge almost entirely from the map, then the scale should be large and the survey and map should be costly, but if for the engineers themselves or others who are familiar with the country, much less labor will be required.

Using a scale of 800 ft. per inch, I have had several hundred miles of maps made for purposes of location and right of way, and usually in lengths of 15 to 20 miles; but never on sheets, and they proved quite as large as our rooms and tables could accommodate. To have made the maps on a scale twice as large, whether on sheets or rolls, would have involved considerably more expense for office room, storage, stationery, draftsmen and so forth.

A third consideration not to be lost sight of is the habit of mind of the engineer making the survey.

One man wishes to make his map a sort of model of the ground, and he wishes to project on that model his location and to determine, before going into the field a second time, just where his location shall be.

I have seen a highly educated and highly esteemed young engineer busily poring over a contour map, laying down exactly his curves and tangents, while he had a party of ten to twelve men in the field running out his scientific location, but upon the ground it was obvious to a practiced eye that the work was a sad failure. Other engineers feel far less dependence upon maps, and are able to conceive clearly, without the aid of a map, how a given change of line will appear upon the ground.

Some engineers even draw a map of a single angle upon comparatively smooth ground, for the purpose of seeing how a given curve will look. Others in such a case would never think of a map.

Now maps have to be adapted to the needs of men, and if an engineer needs a preliminary map on a scale of 200 ft.

ft. on the ground—very nearly one foot to the mile, or again, approximately 400 ft. to the inch.

The fractional scale avoids the use of inches, feet and miles in calculating the distances on the map.

I give here for comparison some scales used in topography.

Scales of Emil Low, *Railroad Gazette*, No. 46:

200 ft. to 1 inch, 25,000; contours 10 ft.

100 ft. to 1 inch, 12,500; contours 5 ft.

Scales of P. F. Brendlinger, in same number:

100 ft. to 1 inch, 12,500; contour not stated.

200 ft. to 1 inch, 25,000; " " "

1,000 ft. to 1 inch, 125,000; " " "

French military scale:

12,500, contours 0.31 metre.

50,000, contour 1.25 metres.

100,000, contour 2.50 metres.

400,000, contour 10 metres.

United States topographical scale:

100,000, contours 20 ft.

Other scales are used by the French and by our government, but the system is not changed.

To aid the eye in estimating elevation, I strengthen, or draw in red ink every fourth or fifth contour line, so as to read 100, 25 or 10 ft., without counting each contour. And all contour lines should be sepia or brown, to distinguish them from topographical features. The 150 altazimuth is superior to any instrument I have used for rapid and exact topography.

R. A. HARDAWAY, Alabama.

QUEBEC, Nov. 19, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I was very much pleased to see in your issue of the 14th really practical articles on "Plotting Preliminary Surveys" and "Standard Scales for Maps of Railroad Surveys."

I think, however, that the work of final location, as explained in the latter article, might be considerably lessened by doing more preliminary work and projecting the final location on the map once for all.

I have known locations where some parts of the line were

For lines which stand little chance of being built, I suppose a surveyor's compass is good enough to run a trial line; but where a location follows, the engineer's transit only should be used.

The "slope-man" and his little "board" are abominations, and I am surprised that they should find a recommendation in any of our modern "Engineer's Pocket Books."

A word about culvert openings: Myers' rule is not a very practical, although, no doubt, a good one.

An engineer once told me to ask the *habitants* the greatest height of water, or observe flood marks; then go to a part of the stream where the banks were steep, the stream contracted and flowing rapidly, measure here the sectional area of the water, and make the culvert as many times larger as there would be increased volume of water flowing in times of freshet, according to the best information obtainable.

Which is the best way to build wing walls of large culverts?

On some roads I see that at the up-stream end they run off, full height, at right angles to the centre line of culvert, or parallel with the track, and are stiffened up by a buttress at end of wing. At lower end, the side walls of culvert are produced out in the same line and stepped down to surface. On other roads both ends are stepped down and played out at angles of 30° to 45°.

LOCATING ENGINEER.

LONG BRANCH, Nov. 25, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In most of Mr. Brendlinger's ideas relating to "standard scales for maps of railroad surveys, etc., I agree, yet at the same time, disagree with him on a few minor points. Preliminary surveys, as he says, should be thorough and more accurately made than is often the case. While I have seen maps in as bad shape as the "Director" reported, others have come to me embracing everything necessary to furnish one with a complete knowledge of the country through which the line was run. Yet in the latter instances it took no more time and but little more



expense, to the mile, than in the case of the incomplete surveys. These unfinished maps are often the efforts of men fitly termed "accidental" engineers, who, having served an apprenticeship to some common land surveyor and thereby gained a smattering of engineering, consider themselves thoroughly versed and competent to start out as a full-fledged engineer. Such engineers, on account of their cheapness, are frequently employed by projecting railroad companies, costing their employers greater expenditures in the end than if they had the services of an experienced engineer. It was once my misfortune to follow such a line up from the plot that had been made of it. I was to have run a sort of preliminary location; but the only way I could find where it had been run was to inquire of the residents along the line, all the old stakes having been removed.

As to the adoption of some standard scale upon which to plot different railroad work I should like to see such a plan consummated.

The following scales I have found very convenient. First, the same given by Mr. Brendlinger, viz., for maps of preliminary surveys on which to project locations and use in the field for locating, 200 ft. per 1 in. I would plot this on sheets 30 in. x 24 in., that I might get an even mile on each sheet and also allow for whatever branch trial-lines might have been run, together with all topography for 1000 ft. on each side of every line, including all roads, streams, buildings, quarries, mines, or other prominent objects, all towns within the limits of the sheets, any township, county or state line which may be crossed, and, most important, 10 ft. contours. Mr. B. suggests 5 ft. contours, but on the scale given, I think 10 ft. is close enough. These sheets to be marked with an arrow head on the margins to connect them. When all the elevations are profiled and grade line determined on profile, there can be traced with pencil on the contours of this preliminary map the grade line as determined by profile, and from this pencil mark the locating engineer can take his party into the field and locate, with all changes or revisions made easy and accurate. Then, the line having been located on the ground, we can take from our notes and preliminary surveys and make our No. 2 map of location (and right of way), also 200 ft. per 1 in., instead of 100, as suggested by Mr. B. I should prefer this scale the same as first map, as it gives a better chance in comparing. I would suggest this map of location should be put on a roll instead of the sheets, as it is not necessary to take this out of the office. The right of way should be on this, as well as all the topography which is on No. 1. I would also put, beside the meridian, all the bearings in red ink along the tangents, for in making a tracing of any one man's property, from this map, it would seem necessary to have the courses together with distances, as all descriptions call for. This roll could and would be just as handy to take before the board of directors for their adoption.

Third, for a general map or study of the country passed through, 500 ft. per 1 in. I would have this on blue-process sheets, 28 in. by 10 in. This map I would have as a general record, having property owners and lines on a meridian, bearing of tangents, P. P. and P. T. degrees of curvature, all bridges, tunnels, towns and all buildings, with name, all streams but no contours, section and mile posts, all sidings, etc.

If, as Mr. Brendlinger says, more money was expended upon surveys, it would lessen the expense on construction ten-fold.

GEO. MCC. TAYLOR, C. E.

NEWTON, Iowa, Nov. 22, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It is barely possible, that between "Director" and your comments Nov. 7, and the communications in following issue of the *Railroad Gazette*, an engineer has been unfairly dealt with.

A map is valuable when it answers the purpose for which it is intended.

The map in question may have been just what was needed by the president and board of directors; all they asked for, and all they were willing to wait or pay for.

I have, myself, traced from a more comprehensive map just such a one as "Director" describes, with neither streams, roads, section lines, or even a meridian; merely to show directness of proposed line between terminal points.

This, in connection with information furnished in other ways, was all I supposed directors needed just at that time.

A map for a certain purpose is the more valuable for having eliminated details not relevant to that purpose.

A reasonable economy may insist that everything should not be shown on all maps. Construction ought not to be delayed while waiting for topographers and draftsmen, although it would not be difficult to cite numerous instances when such delays would have proved a positive gain to stockholders.

It is of some consequence "what the circumstances may be," and it is not "an engineer's duty to show the towns, roads, rivers, streams, contours, etc., on every map he makes."

He has no such rights to assert against the party employing him, and his maps should show just what his employer needs, and no more, especially if time is an important element of value.

If the map in question is not deemed creditable to the man making it, he need not attach his name to it.

It is hardly a question, in ethics, whether an engineer has a right to tax his employer for his "success in obtaining similar or more important work," although there is no law against "working all night till broad daylight" in his own behalf.

He has had a very fortunate experience, who has never mentally criticised his subordinate for not knowing what part of his work would bear *lighting*, when he dare not do it in words, for fear of encouraging carelessness, or the neglect of things essential.

If an engineer considers economy in engineering an intrusion, let him accept a position as "Civil Assistant," say in United States river and harbor work, and let him be ordered to make an "examination," or "survey," of a certain river, with the information that so much money has been appropriated for the purpose, and if he goes beyond that amount, he does it at his own expense.

The chances are that he may not show every thing on his map, or will find out whether or not he is himself a capitalist.

I would dislike, much, to be misunderstood as confounding economy with cheapness, especially in what concerns the location of a railroad, which is giving it its constitution.

It may be sick, almost unto death, by accidents of construction and management, but with a good constitution will eventually recover.

This refers not only to its cost of construction, gradients and alignment, but its relations to traffic. In all but the last, the judgment of the engineer should be supreme.

He cannot learn too much about his subject, or express it too lucidly on his maps and plans, for the correction and enlightenment of his own judgment and the conviction and satisfaction of his chief and consulting engineer. The employers of all these, "no matter how ignorant," have a right also to demand any information they can appreciate, digest and assimilate.

To decide upon the scale of a map without knowing its purpose is as absurd as a rigid rule as to method of developing territory for the purpose of railroad construction. The locating engineer should have, first, as a general guide as to where he will run his first preliminary, a small scale map of his whole territory, showing terminal points, roads and towns within a reasonable distance on either side of line of general direction, as well as threads of streams and direction of drainage.

The territory to be developed may be such that a few miles of difficult work may alternate with long distances presenting no physical difficulties, requiring only straight or nearly straight lines, of which only a profile is necessary.

The engineer, then, after running his preliminary, need work up carefully only that portion of his line where difficulties occur.

Here he should use a scale large enough to show distinctly 5 ft. contours, and every thing necessarily a factor in determining the best possible location.

It should show nothing else, as everything foreign to this purpose detracts from the value of the map.

Outside of cities and towns, a scale of 400 ft. to 1 in. is generally large enough.

Where portions of cities and towns occur, the scale can be increased, and perhaps they can be placed on the same sheets, thereby duplicating such portions of the map.

For a general map, showing the whole line continuously, 1,000 ft. to 1 in. answers the purpose, even for a right-of-way map outside of cities and towns. This should show towns, cities, roads, rivers and everything necessary to satisfy any one interested who may not be an expert in location; and hatching can be substituted for contours.

Such a map is sufficiently large for careful measurement of distances and angles, and is suitable for filing at county seats and state capitals.

The law requiring such filing should be explicit as to scale.

I know one state where the law requires any railroad receiving a subsidy to file its location before the subsidy is voted, and to build within 40 rods of location so filed.

This law has been evaded by filing a map of scale so small that "located" line shown upon it could be half a mile or more wide, and would cover many kinks and depressions in final location.

[It seems that much of the divergency of views expressed in the above letters arises from a difference in the "point of view." For easy open country, with few ragged, rocky points or surface slopes of over 10° or 15°, 800 or 100 ft. per inch may be a quite large enough scale, but wherever the country is at all rough the error almost invariably is to use too small a scale. For such country, intelligently made contour maps covering only the ground really required are a great assistance, which cannot be advantageously dispensed with, provided they be not abused by making the subsequent field-work merely perfunctory and intrusting it to less expert hands. If contours are to be added at all, or in fact many details of any kind, equal accuracy can be obtained much more cheaply with large scales than with small ones. The disadvantage of a large scale noted by Mr. Dodge, that the maps tend to be so bulky, is one of the strongest objections to making them upon large sheets 6 to 10 ft. long, which must be rolled subsequently. In spite of Mr. Dodge's opinion to the contrary, which his large experience entitles to great weight, we believe this to be always and everywhere a mistake, when the smaller sheets of say 20x24 or 24x30 are properly used; although if larger sheets are ever justifiable it is in easy country where long tangents prevail and narrow strips can be used without constant danger of the line running off the side. But by using the smaller sheets,

always of uniform size and matched together by quickly pencilled X's when the plotting is first begun, there is never any waste paper at the sides of the line, and in addition to its being materially more convenient for field drafting we have the following great advantages.

1. The maps always remain flat and can be stowed away, for 10,000 miles of surveys, in a single small case of drawers of equal sizes, where they are entirely protected from dust, not occupying one-tenth the space required for an equal mileage of rolled maps.

2. Any desired section, long or short, of any of the surveys is readily and instantly accessible, and can be spread out for examination or work on a table of any size, without having to examine a lot of dusty rolls and perhaps clean off a large table to match together two long sheets with the line on them falling in the most inaccessible part of the table.

For these reasons, a large scale, if for any reason desirable, does not involve considerably more "expense for office room, storage, stationary, draftsmen and so forth," although it certainly does do so with rolled maps.

It ought to be needless to say that with sheets thus used the map is plotted from one to another as if they were one continuous sheet of paper pasted together instead of being simply lapped over each other and fastened by thumb-tacks.

In answer to "A," it may be noted that the map which started this discussion was stated to be the only one turned in after an ordinary preliminary survey through a country of some difficulty.—EDITOR RAILROAD GAZETTE.]

#### Car Couplers.

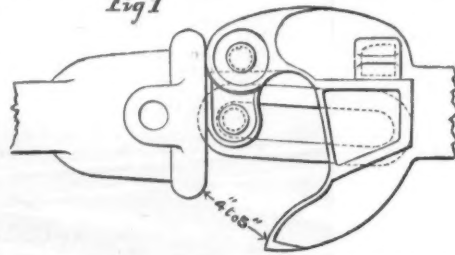
PITTSBURGH, Pa., Dec. 1, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE.

A query in your editorial columns, and the following extract from a letter read before the Master Car-Builders' Club, at New York, prompts me to transmit to you the accompanying diagram of the Janney and the common draw-bar, as brought together in the act of coupling.

The letter alluded to states that: "The Janney is manifestly more dangerous to the brakeman than the coupling of the two common draw-bars; the Cowell and the Miller are equally if not more dangerous than the coupling of two common draw-bars; the Hilliard and the Byron are equally

Fig 1



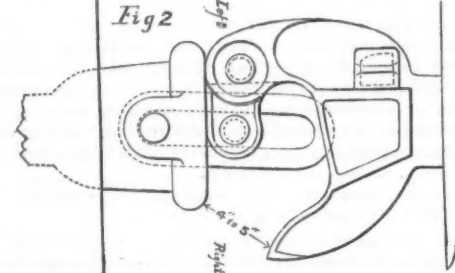
dangerous, and the Ames is less dangerous where the common draw-bar is lower or of equal height, but more dangerous where the common draw-bar is higher than itself."

Under no conditions does more danger attend the coupling of the Janney to the common draw-bar than attends the coupling of two of the latter. In coupling the Janney to the common draw-bar, the trainman can choose for himself whether or not he shall take the usual risk of the current practice or couple with absolute safety to himself.

Fig. 1 illustrates how the link may be secured in the ordinary way in the common draw-bar, and coupled (on the right) to the Janney, the hand passing through the opening between the two couplers. This opening can never under any circumstances be closed.

Fig. 2 shows the link thrown back into the throat of the

Fig 2



Janney, and the couplers brought together. The coupling in this case is made—the cars being stationary—by passing the hand through the aperture shown and shifting the link into place in the common draw-bar, the operation being performed from side or top opening, and standing on right or left.

When necessity requires a coupling to be made with a moving car and upon the left of the Janney, if such a necessity can be said to exist at all, the same conditions are presented which exist as between two common draw-bars, and the danger is no greater.

Many imagine that the Janney and the common draw-bar "glance" and pass each other when brought in contact. This is not true, not possible, in fact; and is an opinion held only by those who have not taken the trouble to investigate.

Perhaps the gentleman who announces that "the Janney



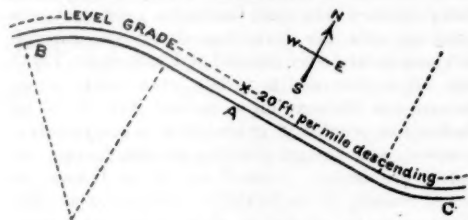
is manifestly more dangerous to the brakeman than the coupling of two common draw-bars," will kindly give us a diagram of the grounds which make it so manifest.

W. MCCONWAY.

#### Irregular Creeping of Track.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Three years ago I had charge of a piece of track on the New York & New England Railroad across the Connecticut River and meadows, about  $1\frac{1}{2}$  miles east of Hartford, Conn., which acted in a rather singular manner.



The accompanying sketch represents the piece referred to, which was single track (main line), and used by an equal number of east-bound and west-bound trains. The grades are shown on the sketch. Now in the course of a year the south rail traveled east 5 ft. 1 in., and the north rail traveled west 18 in. I have asked quite a number of road-masters and trackmen how they explained it, but none could. If both rails went the same way, I could understand it, or if the track was used only by trains going the same or one way, but in this case there was the same number of trains each way. If you deem this worthy of notice please insert it in your paper, as I would like to get the opinion of others.

NUT LOCK.

#### The Standards of the Master Car-Builders' Association.

The following circular has been issued:

NO 71 BROADWAY, NEW YORK, Dec. 1, 1884.

To the Members of the Master Car-Builders' Association:

Your attention is called to the list of standard dimensions, forms of construction, etc., which have been recommended by your Association, and which will be found on pages 166 to 189 of the Eighteenth Annual Report, a copy of which is sent herewith. At the last convention the previous action of the Association with reference to standards was carefully revised, and a number of errors and discrepancies were then rectified. The needed corrections have been made in the list referred to, which includes all the standards that the Association has thus far recommended, and it is hoped that members who have not already adopted any or all of them will do so as early as possible.

It is also of very great importance that those who are under the impression that they are using the dimensions and forms of construction which have been prescribed by the Association, should compare their practice with the descriptions of the standards as published in the list referred to, and in plates VIII. to XII., appended to the report. If such comparisons are made, there is reason for believing that very material differences may, in some cases, be found between the dimensions of the parts in use and those specified by the Association. All who think that the journal bearings and boxes which they are using are in accordance with the Master Car-Builders' standards are advised to compare their patterns with plates X. and XI. In some instances, when this has been done, the discrepancies and differences in size have been found to be so great, that what were nominally standard bearings of one road would not interchange with those used on another. The same thing is often true of screw threads, and the attention of members is, in this connection, called to the resolution on page 169 of the annual report.

One of the main objects which the Association aims to accomplish is "to bring about uniformity and interchangeability in the parts of railroad cars." This end will be defeated if members either knowingly or ignorantly depart from or attempt to "improve" the standards, or make alterations in them. An axle which is one half inch longer or shorter than the length which the Association has recommended, is no more a standard than a yard-stick would be which was that much too long or too short.

LEANDER GAREY, President.  
M. N. FORNEY, Secretary.

#### Transportation in Congress.

In the House on Dec. 3d:

Mr. Reagan, of Texas, called up the Inter-state Commerce bill, and the House decided to consider it.

Mr. Reagan offered as a substitute for the bill reported by the Committee on Commerce last session the bill generally known as the "Reagan bill," and entered into an exhaustive comparison of the two measures, his remarks being listened to with great attention. At the close of his speech the House adjourned without action.

#### TECHNICAL.

##### Car Notes.

The Barney & Smith Manufacturing Co. in Dayton, O., has an order for 20 first class passenger cars for the Chicago, Milwaukee & St. Paul road.

The Pullman shops at Pullman, Ill., have recently received orders for 12 sleeping cars for the Baltimore & Ohio road and 41 passenger cars for the Manhattan Elevated lines in New York.

The Peninsular Car Co. in Detroit is to furnish 200 box, 200 stock and 100 coal cars, to the Wabash, St. Louis & Pacific road.

The United States Rolling Stock Co. has its new shops at Hegewisch (South Chicago) now nearly all under roof, and is putting in the tools. They will be fully ready for work about the end of December.

##### Bridge Notes.

The piers of the bridge of the Missouri River at Kansas City, which have been damaged to some extent by the frost and water, are to be repaired by the use of "Beton Coignet," under the superintendence of Mr. John C. Goodridge, of New York. The beton or artificial stone has heretofore been used with much success for similar purposes.

##### Iron Notes.

The furnace of the Carthage Iron Co. in Carthage, N. Y., was almost entirely destroyed in the latter part of October, in a fire which swept away almost the entire town. It is

stated now that the company has decided not to rebuild the furnace.

Dr. S. C. Baker, owner of Allegheny Furnace, in Blair Co., Pa., recently made an assignment. The furnace, however, will continue in blast, at least until the stock now in hand is used up.

Charlotte Furnace at Scottdale, Pa., has gone into blast. The furnace has been idle since July last.

The mill of the Westlake Iron Co., at Warren, O., has shut down and it is uncertain when it will be started up again.

The property of the Wellston Coal & Iron Co., at Wellston, O., has been sold to McClintick & Smith, of Chillicothe, O. The sale includes the furnace, coal mines and the coal lands belonging to the company.

The Helmshaber Forge and Rolling-Mill Co. in St. Louis, has started up two of its axle hammers, and states that trade is improving.

Lemont Furnace in Fayette County, Pa., has gone into blast after nearly a year's idleness.

Otis Furnace at Mancelona, Mich., has been repaired, and has gone into blast again.

Low Moor Furnace at Low Moor, Va., went into blast Nov. 15, after a stoppage of three months.

#### Manufacturing and Business Notes.

The A. S. Cameron Steam Pump Works in New York have been granted a diploma and medal of highest award at the Louisville Exhibition.

The Chalmers-Spence Co. in New York, manufacturer of asbestos boiler covering, has contracted to make, for the Philadelphia Academy of Music, a drop-curtain, two-thirds asbestos and one-third cotton, about as thick as a Wilton carpet. The sides of the stage are also to be protected with asbestos board, lined with wire cloth.

Robert Wetherill & Co. in Chester, Pa., recently shipped a 300 H. P. Corliss engine to the New Orleans Exposition. It will be used there to run the exhibit of textile machinery. They are also building two large Corliss engines for mills in Philadelphia.

The Westinghouse Machine Co. in Pittsburgh has received an order for a Westinghouse automatic engine to be used in one of the iron-clad ships of the British Navy for the purpose of operating a dynamo from which electricity is to be obtained for lighting the ship.

The Eames Vacuum Brake Co. has been re-organized by the choice of John C. Thompson, of Boston, President; James H. Slade, of Boston, Vice-President and Secretary; George B. Massey, of Watertown, N. Y., Treasurer. Mr. Elisha B. Eames continues with the company as Superintendent of the Factory, at Watertown, N. Y., and as a member of the board. On and after Dec. 1 the main office of the company will be located at No. 123 Oliver street, Boston. L. G. Tillotson & Co., Nos. 5 and 7 Dey street, New York, are general sale agents for the company in the United States, exclusive of New England, and Mr. George F. Coebowner, No. 15 Oliver street, Boston, is general sales agent for the New England states and Canada.

#### British Rail Exports.

Exports of rails from Great Britain to the United States and to all countries for the month of October and the ten months then ending are reported as follows by the Board of Trade, in tons of 2,240 lbs.:

	1882.	1883.	1884.	1882.	1883.	1884.
To United States:						
Iron rails.....	211	24	...	21,127	2,593	18,894
Steel rails.....	23,431	5,575	351	182,506	56,877	16,469
Total.....	23,642	5,599	351	203,633	59,470	16,476
To all countries:						
Iron rails.....	2,128	798	960	42,708	22,000	12,531
Steel rails.....	82,569	58,996	39,800	635,124	638,417	460,182
Total.....	84,697	59,794	40,760	677,832	660,417	472,713

The exports to this country were entirely insignificant this year in October, 351 tons against an average of 1,792 monthly for the previous nine months of the year. In September they were but 7 tons and May but 50, but with these exceptions the exports to the United States were smaller than in any other month since 1878. For the ten months ending with October they were 72 per cent. less than last year and 91 per cent. less than in 1882.

The exports to countries other than the United States, in October, were 40,409 tons this year, against 54,195 last year and 61,055 in 1882. The decrease is thus considerable, but much less than in those to the United States. For the ten months the exports to these other countries were 456,337 tons this year, against 600,947 last year and 494,199 in 1882, so that though the decrease since last year is large (32 per cent.) since 1882 it is quite moderate (7% per cent.).

#### Steel Ferry-boats.

The Continental Iron Works at Greenpoint, N. Y., are building two new ferry-boats for the Union Ferry Co., the peculiarity of which is that their hulls are of steel. Their dimensions are: Length of deck, 195 ft.; width, 63 ft. Hull, length on water line, 183 ft.; 36 ft. 6 in. wide, with a draft of 7 ft., and 13 ft. 4 in. from water line up. When finished they will have cost about \$125,000 each.

#### Painting Cars.

At the last meeting of the New England Railroad Club a long discussion took place on this subject, but no especially new facts which have not already been fully given in these columns were developed other than the several practical instances of the great value of a little extra time in the paint shop. The injurious effect of using too much drier and requiring varnishes to have a very high lustre was also dwelt upon.

#### THE SCRAP HEAP.

##### A Singular Accident.

The air cylinder on the engine on the 11:45 accommodation, Ft. Wayne Railroad, burst yesterday morning at Dixmont station. The engineer and fireman had to jump for their lives, as had they remained they would have been scalded to death with the escaping steam from a rupture in the boiler caused by the explosion. The report of the explosion was terrific and was heard for over a mile. None of the passengers were injured, but they were badly frightened. *Pittsburgh Chronicle-Telegraph*, Dec. 2.

##### The Persistent Tramp.

A peculiar specimen of the genus tramp rolled into the Central on the arrival of the 9:25 train last night. His outer garment resembled an ancient toga more than a coat, except that it looked ancient and it was decidedly more tattered than a well-regulated toga ought to be. He carried, with a tenacious grip, a black valise that looked as though it had passed through several political campaigns. The conductor said he had put the man off the train three times between Syracuse and Rochester, but, like Coquelinot, he had "bolshed up serenely" every time when the train got under headway. The discouraged conductor finally asked, "Why don't you steal a ride on a freight train? Don't you know this is the 'flyer'?" And the laconic answer came back, "The flyer's just what I want."

The tramp was bound for Buffalo, but his free ride ended here. The doorman bundled him out of the depot sitting-room. Thereupon he assumed an injured air and reluctantly produced 70 cents in battered coins and bought a ticket for Buffalo. He was passed into the depot, where he sat patiently on his valise until the arrival of the express. *Rochester (N. Y.) Herald*.

#### The Judge and the Conductor.

The late Chief Justice Bigelow, of Massachusetts, on one occasion was brought to his bearings in a way as effective as it was amusing. He was riding in a car which did not stop at Quincy, where he resided, and as it was passing by he pulled the rope and the train was brought to a sudden stop. The conductor rushed into the car and demanded, "Who rung that bell?" "I did," said the Chief Justice. "Why?" "Because I want to get off." At which the railroad official indulged in some remarks which were not complimentary and hardly respectful. The judge afterward complained to the President of the road, who promised to look into the matter. But he found that although the conductor might have used hot language the Chief Justice was not without fault, and said nothing about it. When they next met, by chance, the latter demanded of the President whether he had reprimanded the conductor. "I spoke to him," was the reply. "Well, what did he say?" "He said he was coming up some day to adjourn your court." The irate magistrate saw the point, and did not pursue the investigation. *Every Other Saturday*.

#### A Political Train Order.

A conductor in Minnesota has concocted the following train order:

"Wigwam 108.

"CLEVELAND, Engr.

"Run from Albany to Washington regardless of regular trains; meet and pass Blaine wild west at New York city. Look out for Butler's work train between Boston and New York. Keep sharp look out for St. John at Harlem River water tank. As you pass Salt River Station look out for Lockwood working under flags. This order void after Mch. 4, '85.

"O. K.

"Fox, Condr., G. B. W. & St. P. Ry.

"T. D."

#### Tired of Living.

The carelessness sometimes displayed by engineers (who have charge of boilers is simply criminal, and deserves the severest penalties. A recent occurrence will illustrate this. Visiting an establishment where we had boilers insured, our attention was attracted by the suspicious actions of the engineer. Watching for what he supposed was a favorable opportunity, he climbed up on top of the boilers and headed toward the safety-valve, always keeping as nearly between it and us as he could, but not, however, succeeding in always keeping it from view. Reaching the valve he busied himself a few moments about it, and then returned with a nonchalant air to where we were. The following conversation then occurred:

Inspector: "Tired of living, are you?"

Engineer: "No; what do you mean?"

Inspector: "I thought perhaps you were."

Engineer: "What makes you think so?"

Inspector: "Why, from the use you make of that wedge you now have in your overalls pocket. I see that you had the safety-valve fastened down with it. Now if you want to die, why don't you go out and jump into the river, and drown yourself; then nobody's life but your own would be endangered?"

Engineer: "Those boilers are all right. I don't believe a boiler can blow up so long as there is plenty of water in it. I have been running boilers 20 years." And so on.

He had actually made an iron wedge, and driven it into the forked guide above the lever, so that it was impossible for the valve to lift, in order to "bottle up the steam," as he expressed it. And this in spite of the facts that the pressure was all that could be safely allowed, and that he had also moved the weight out on the lever 15 lbs. beyond the limit allowed.

If we wish to run a boiler for a reasonable number of years, we must limit it to a safe pressure, under which it will do its daily duty for a term of 15 to 20 years without showing signs of distress. Experience has shown that one-fourth to one-fifth of the bursting pressure is the greatest under which a boiler should be habitually worked. *The Locomotive*.

#### Hard Worked Officers.

Speaking of the election of officers of the Utah Eastern road, the Salt Lake (Utah) *Herald* says: "The duties of the newly elected officers, and particularly the Superintendent and his assistant, will be onerous and trying in the extreme. They will consist of a vigilance almost superhuman, to see that a puff of smoke never by any possibility ascends from the shops of the company; that the foot of the whistle is sacredly excluded from along its line; that the rails rust with all possible facility, and that the rolling stock of the company does the best possible service on the Utah & Northern. The present force may suffice for these duties for the time being, but sooner or later, we are convinced, their hands will have to be strengthened."

The Union Pacific Co. owns the road, but does not work it, having bought it to prevent its completion as a rival coal road to Salt Lake.

#### RAILROAD LAW.

##### Bill of Lading—Limitation of Liability.

In the case of Hart vs. the Pennsylvania Railroad in the Supreme Court of the United States, the plaintiff shipped five horses and other property in one car by the railroad, under a bill of lading signed by him, which stated that horses were to be transported upon terms and conditions which were admitted and accepted by him as just and reasonable; first to pay freight thereon (at a rate specified) on the condition that the carrier assumed a liability on the stock to a sum not exceeding \$200 each. By the negligence of the railroad, or its servants, one of the horses was killed and the others were injured, and the other property was lost. In a suit to recover damages it appeared that the horses were race horses, and the plaintiff offered to show damages based on their value, amounting to over \$25,000. The testimony was excluded and he had a verdict for \$1,200. This Court holds: First, that the evidence was not admissible and the valuation and limitation of liability in the bill of lading were just and reasonable and binding on the plaintiff; second, that the terms of the limitations covered a loss through negligence; and, third, that where a contract of the kind signed by this shipper is fairly made, agreeing on a valuation of the property carried, with the rate of freight based on the condition that the carrier assumes liability only to the extent of the agreed valuation, even in case of loss or damage by the negligence of the carrier, the contract will be upheld as a proper and lawful mode of securing a due proportion between the amount for which the carrier may be responsible, and the freight he receives, and of protecting himself against extravagant and fanciful valuations. The judgment of the Circuit Court is confirmed.





Published Every Friday.

## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

## EVEN VS. BROKEN JOINTS.

The results presented in another column are certainly what a politician would call a "sweeping victory" for the practice of laying track with broken, or "staggered," instead of even, or opposite, joints. With all the advantage of "possession" in favor of even joints—nearly five-eighths of the existing mileage of the United States being now so laid—the responses show: 83 companies, or 58 per cent., in favor of broken joints; 45 companies, or 32 per cent., in favor of even joints; 15 companies, or 10 per cent., doubtful or ambiguous, in a total of 143 companies, representing 90,414 miles of railroad.

The vote by mileage represented, instead of by the number of companies, is not quite so decisive, as might be expected from the fact that the region of even joints is also the region of long lines. Measured even in this way, however, the result is very greatly in favor of broken joints, there being a plurality of nearly 50 per cent. (40,628 miles against 28,466) in favor of broken joints, with about one-quarter of the whole vote (21,320 miles) scattering or doubtful.

On the other hand, the form of this vote gave opportunity to indicate not only what was believed, but how hard it was believed, by adding qualifying expressions, and this has been taken advantage of so extensively as to indicate still more clearly a growing preference for broken joints among officers in charge of track. Of the 84 railroads (37,283 miles) now wholly or chiefly laid with broken joints, two only, and those very small ones (aggregating 103 miles), favor a change to even joints, whereas out of 59 railroads (53,131 miles) five important lines (aggregating 8,390 miles) favor a change to broken joints.

Of the companies now using broken joints, 83½ per cent. are unqualifiedly in favor of it and 9½ per cent. more are in favor of it on comparatively good track; aggregating 93 per cent. of the companies and 86½ per cent. of the mileage, the remainder (except 103 miles) being simply doubtful.

Of the companies now using even joints only 39 per cent., operating only 27 per cent. of the even-joint mileage, are unqualifiedly in favor of it; 18 per cent. favoring it only on tangents, with broken joints on curves, and 20 per cent. favoring it only on comparatively poor track; aggregating only 77 per cent. of the companies and 53 per cent. of the mileage in favor of what they now use. Nine per cent. of the companies, with 16 per cent. of the mileage, favor a change to broken joints.

Considering the returns in another way and neglecting the large mileage from which no positive opinion of any kind was received, we have, out of 128 com-

panies controlling 60,194 miles from which more or less positive opinions were received, the following:

	Companies.	Mileage.
In favor of broken joints on curves, with fair track.....	99 (77 p.c.)	46,288 (67 p.c.)
In favor of broken joints throughout on fair track.....	89 (69½ p.c.)	37,202 (54 p.c.)
Unqualifiedly in favor of broken joints.....	70 (55 p.c.)	30,122 (43½ p.c.)
In favor of even joints on tangents, with comparatively poor track.....	51 (40 p.c.)	30,479 (44 p.c.)
In favor of even joints throughout on comparatively poor track.....	41 (32 p.c.)	21,302 (26 p.c.)
Unqualifiedly in favor of even joints.....	22 (17 p.c.)	14,313 (20½ p.c.)

Thus the tendency in favor of using broken joints is seen to be unmistakable, and an examination of the tables elsewhere presented will show that the tendency is confined to no section, so far as indicated by expressions of opinion. These expressions may be summarized as follows, in the percentages of the mileage favoring even or broken joints in each of seven groups of states and territories:

Group	I. (New England)	II. (N. Y., N. J., Pa., Del. & Md.)	III. (Va., W. Va., N. C., S. C., Ga., Fla., Ala. & Miss.)	IV. (Tenn., Ky., Mo., Ark., Ind. T., La., Tex. & N. Mex.)	V. (O., Mich., Ind. & Ill.)	VI. (Wis., Minn., Dak., Iowa, Neb. & Kan.)	VII. (Remaining states and territories west of Dak. and N. M.)
Favoring Even joints.	34	83½	1	31½	33½	60	18½
Favoring Broken joints.	55	85	90	27½	38	7½	81½
Doubtful.	11	4½	9	41	28½	33½	20½
Total of United States.....	31½	45	29½				

The same tendency is also shown by the number of lines which are reported to be now changing from even to broken joints, such as the New York Central, the elevated railroads of New York and half-a-dozen New England lines; whereas no lines of importance are reported as now changing from broken to even joints excepting the Long Island Railroad.

The responses received indicate that in Canada broken joints are almost unknown. In England only 1,535 miles of the 5,634 from which we have reports is laid with broken joints, and the use of even joints is, we are informed, even more nearly universal than these figures would indicate. In Germany, there is absolutely no track laid with broken joints, and the same is true, so far as now appears, throughout Europe. In the "Technical Report of the German Railroad Union," in 1876, although almost every other conceivable variation in practice or doubtful point was discussed in the responses to the 171 questions of a circular of inquiry, the only response to a question on this subject was that "Experiments had not been carried sufficiently far for a report."

The United States therefore appears to be the only country in which laying track with broken joints has been practiced on a large scale, or even, so far as the information now at hand indicates, the only country in which anything like an extended test has been made. The fact that the tendency here is so decided in favor of it cannot but be regarded everywhere as strong *prima facie* evidence that the practice is a good one.

The curious geographical distribution of practice, as shown in the map on another page, will attract attention. It is difficult to give any rational grounds for this. If it were simply a preponderance of practice in favor of one plan or the other, in the various sections, this might be done, for it will be obvious that broken joints as now used are confined chiefly to the regions where the road-bed is least likely to be disturbed by frost, either because of the mildness of the climate or because of the solidity and good drainage of the ballast and the freer use of it. The great stronghold of even joints, on the contrary, lies in Canada and in the region north and west of Chicago, where the frosts are very severe and the ballast and drainage often of the poorest. The drift of the responses indicates that this may be the chief cause for the divergency, since they show a general feeling that even joints if used at all are most suitable for poor track, and broken joints for good track.

But it is plain that, if this be in fact the true explanation for part of the divergency, it cannot be the only one, for that alone would neither justify placing the geographical lines of demarcation exactly where they are, nor, still less, such exclusive following of the prevailing custom in either section. A considerable minority in at least one section must have been simply playing the game of "follow my neighbor." For example, in the Southern States the average condition of the track is comparatively poor, and there is a great deal of it with little or no ballast or drainage, so that many lines must be in far inferior condition to thousands of miles in the Northwest, much of which is in all respects very fair track. If, then, broken joints are good practice in the South, why are they bad practice in the North? Similarly in the extreme West and Southwest there is little or no trouble from

frost, and there are thousands of miles through regions which furnish a dry and good natural road-bed. Why, then, should broken joints be the favorites in New York and New England and even joints the favorite in Texas and New Mexico?

Comparison with European practice makes the result still more peculiar. If we are acting simply from climatic reasons in our diversity of practice, so that each plan is alike proper in the section where it prevails, Europeans at least are not. Almost the whole mileage of the world outside of this country lies in milder climates than ours, has cost a good deal more money per mile, has been more slowly and carefully built, and is far better drained and ballasted. Yet the same arguments which justify even joints around Chicago and broken joints around New York and Washington would, if extended to a comparison of American and foreign practice, require foreign railroads to use broken joints if any did, and make this the last country in the world for such an experiment.

There must be, in part at least, some other reason than a good reason for such divergency as this, since no explanation of anything is entirely good which does not explain all the facts. Nevertheless, the facts that not a single line of much importance south and east of Chicago (three only excepted, the Delaware & Hudson, Long Island and Ohio & Mississippi) is now on record as favoring even joints, and that the territory where broken joints prevail is that where traffic is heaviest, tell strongly in favor of the conclusion that broken joints are in fact the best practice, on fairly good road-beds at least. The prevailing European practice of the country may be ascribed in part to conservatism and in part to the fact that European roads in general have been so well built from the beginning that "let well enough alone" was a fairly safe motto.

It is quite probable that the original construction of the railroads of the West with even joints was favored because of the great rapidity with which many of them were built. The great feats of tracklaying, five or six miles a day, of which we hear so much, would not have been possible with broken joints. A very large proportion of Western railroads were originally built in great haste by parties who had little interest in them other than that of getting them done as cheaply and as soon as possible, not caring for their efficiency afterward. This, however, does not explain why the practice is now favored by engineers of excellent judgment who have had the care of these tracks for a score of years or so during operation, within which time some parts of the roads have been changed from wretched unballasted lines to magnificent structures, carrying a traffic exceeded by few railroads in the East.

The time of the introduction of broken joints in this country has not been ascertained, but it must have been on some of the earliest lines and long before the days of steel rails and fish-plate joints, which now seem to be regarded as especially justifying the use of broken joints.

## The Lake Shore's Last Quarterly Report.

The Lake Shore & Michigan Southern quarterly statement, for the three months ending with September, shows the profits after paying working expenses and fixed charges to have been but \$420,344.38, which is but 85 cents per share of stock. During the quarter ending June 30 these profits were 95 cents per share, and in the first three months of the year they were 97 cents per share—for the nine months \$2.77 per share. Meanwhile the dividends paid have been \$2, \$1.50 and \$1.50, or \$5 in all, which is \$2.23 more than the profits have been.

The gross and net earnings, working expenses, fixed charges and balance this year and last, for this quarter to Sept. 30, were:

	1884.	1883.	Inc. or Dec.	P.c.
Gross earnings.....	\$3,741,270	\$4,540,239	— \$798,969	17.6
Exps. (and taxes).....	2,356,917	2,630,086	— 273,169	0.7
Net earnings.....	\$1,384,353	\$1,931,153	— \$546,800	28.3
Fixed charges.....	904,009	874,702	+ 29,307	10.2
Balance.....	\$420,344	\$1,056,451	— \$636,107	60.2
Per share.....	\$0.85	\$2.13	— \$1.28	60.2

The great decrease of 28 per cent. in net earnings is in spite of a large decrease in expenses. The addition of 10 per cent. to the fixed charges further reduced the balance available for dividends, which is no less than 60 per cent. less than last year—85 cents per share instead \$2.13.

So far as rates are concerned, this third quarter of the year was less unfavorable than the second quarter, during the whole of which the open rate from Chicago to New York was but 15 cents per 100 lbs., but it was a time of much lighter traffic. The gross earnings were \$203,000 more in the third than in the second quarter, but the working expenses were \$181,700 more, while the interest on the funded debt was



larger by \$60,750, so that it was the latter which reduced the balance available for dividend.

For the nine months ending with September the comparison with last year is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Gross earnings.....	\$10,900,397	\$13,730,410	— \$2,760,013	20.1
Expenses.....	8,357,574	8,332,053	— 1,474,470	17.7
Net earnings.....	\$4,132,823	\$5,427,357	— \$1,294,534	23.9
Fixed charges.....	2,763,867	2,924,105	+ 130,762	5.3
Balance.....	\$1,368,956	\$2,503,252	\$1,434,296	51.2
Per share.....	\$2.77	\$5.06	\$2.80	51.2

The decrease in gross earnings was at a less rate in the last quarter than in the first two, but that is true of the working expenses also, which were reduced nearly five times as much in the first two quarters as in the third, so that the decrease in net earnings was largest in the last quarter, and as the chief part of the increase in interest came then, this is even more true of the balance available for dividend. The net earnings, and this balance were in each quarter of each year:

	First.	Second.	Third.	Fourth.
Net earn. 1883.....	\$1,777,415	\$1,718,789	\$1,931,153	\$2,084,446
1884.....	1,375,303	1,374,107	1,384,353	.....
Balance.....	890,713	844,087	1,056,452	1,209,744
1883.....	477,708	470,903	420,344	.....

Last year the net earnings and the divisible balance were much greater in the third and fourth quarters than in the first and second quarters of the year, so that of the \$8.12 per share earned during the year, \$4.54 was made in the last half of the year. This year the net earnings and surplus have varied little in the three quarters, but the latter was least in the third quarter.

Two-thirds of the fourth quarter have now passed, with more disturbances in rates than in the third quarter, especially passenger rates, but a much larger traffic. The decrease from last year (when the profits of the quarter were \$3.45 per share) will probably be large, but if rates are maintained through December as well as they are now, especially since rates on live stock have been restored, the profits will probably be larger than in any other quarter of this year.

The balance sheet submitted with the last quarterly report shows an increase since June of \$3,500,000 in the funded debt, of which no announcement had been made theretofore, and also an increase of \$2,000,000 in the holdings of the stocks and bonds of other companies. The dividends paid this year have exceeded the profits of the year by \$1,104,368; and though the accounts of the company show a large accumulation of undivided profits since its organization, of course these were not in the form of money or property which could be sold, but in improvements and other assets which the company needs to preserve. Therefore the money for a large part of the dividends paid this year must have been raised by borrowing, and the fixed charges of the company have been increasing, while its net earnings were decreasing at an alarming rate. It is not to be expected, however, that the decrease will continue. A restoration of rates such as is entirely practicable, and most of which has been, for the time, accomplished, will largely increase profits without any increase in traffic, and a large winter traffic in through freight east may reasonably be expected. The other traffic cannot be expected to improve rapidly, and light earnings for some time to come seem inevitable. But if rates are maintained the road should easily at once earn more than the 92 cents a share per quarter which has been its average profit this year, in spite of the late increase in the funded debt.

The boatmen are said to complain that the season on the canal has been an especially unfavorable one, and that they have little hope for the future. The facts reported during the season do not support this complaint. Rates on grain have been higher than last year, and the shipments down to the end of October, though about a sixth less this year than last, were nearly as great as in 1882. There has probably been a large falling off in lumber, which is now perhaps a more important freight than grain to the canal boats. The cuts in rail rates that have been made during a large part of the season of navigation this year have had a bad effect on canal traffic, though they have not served to make the railroad business great.

The state has now done its best for the boatman; for two years they have had the use of the canal without paying anything for interest on its cost; and even the cost of repairing it has been paid by taxation. Yet with all this the boatmen complain that they cannot make a living.

A correspondent on another page describes a strange case of creeping of rails, in which on a single-track main line the north rail moved 5 ft. 1 in. east and the south rail of the same track moved 18 in. west in the course of a year. This is more remarkable even than enormous creepage on the St. Louis Bridge, which in the *Railroad Gazette* of Oct. 31 last was reported to have been 260 ft. per year on the bridge proper and

400 ft. on the approaches. This report seeming incredible, we made inquiries of Prof. J. B. Johnson, author of the paper in which the statement was made, who replies:

"The figures are correct as reported. The rails do creep about a foot and a half a day in the direction of the traffic; up a grade of 80 ft. to the mile and 2,500 ft. long on one side, and down the same grade on the other side, the downward creeping being 13 per cent. more than the upward. These figures are official, for they are taken from the daily record book of the track foreman for a whole year, Sept. 1, 1883, to Sept. 1, 1884. The bridge company keeps a squad of five trackmen by day and three at night, whose chief business it is to correct the movement by taking out and replacing rails."

Professor Johnson has made an elaborate study of this remarkable phenomenon, and his account of the facts and arguments as to the causes are embodied in a paper which will shortly appear in the *Journal* of the Associated Engineering Societies.

The prospect for maintaining through freight rates between the East and the West this winter seems good—better than it has been, at least. The eastern trunk lines seem united and determined that the value of the business shall not be ruined. At present the east-bound rates seem generally to be well maintained, but there is some difficulty at Peoria. The greatest present difficulty in the way of maintaining these rates is the establishment of lines which enter Chicago over railroads not in the pool, sometimes using but a few miles of them. Some of these seem to have been established or permitted by trunk line managements for the purpose of enabling them to secure a traffic in addition to their pool percentage, but as the almost inevitable result of any such evasion of an agreement is a reduction of rates and the destruction of a large part or the whole of the profits on the business, it is not easy to believe that it will be continued. One line is made over the Chicago & Eastern Illinois, connecting with the "Big Four" (Cincinnati, Indianapolis, St. Louis & Chicago), which for Baltimore business makes a reasonable line, though it deprives the Baltimore & Ohio of a large part of the haul. Another has been made over the Louisville, New Albany & Chicago, the freight going first southeast 88 miles to Monon, and then due north 43 miles on the Air Line Division of the same road to the Chicago & Grand Trunk at Haskell's. Thus it goes 131 miles to reach Haskell's, while the distance by the Grand Trunk's own line is 63 miles. Still another is over the Wabash southwest 92 miles to Forrest, and thence over the same road, east by north, 319 miles to Detroit, making a line 411 miles long to Detroit, against 284 by the Michigan Central. But such lines depend upon the trunk lines and their Western connections for their existence, and if the trunk line managers are united they can prevent their demoralizing rates.

The apportionment of freight other than live-stock at Chicago has not yet been made. Judge Thomas M. Cooley, as arbitrator, has been engaged on the question in New York this week. The definite settlement of it is important only in order that prompt and frequent settlements of balances may be made by money payments without risk of having to return them, as the arbitration will date back to Jan. 8.

The restoration of rates on live stock and dressed beef depended upon the Lackawanna entering the pool on this traffic. During the last half of last year it competed actively and successfully for this valuable business, making concessions to shippers such as amounted to a considerable reduction, not only from the regular rate of 40 cents, but also from a cut rate of about 30 cents which the co-operating roads made at that time. But after June these roads reduced the rate to 20 cents, and under that the Lackawanna has carried very little live stock. After negotiation it was willing to accept a 10 per cent. of the New York receipts (the receipts at New York are pooled by the trunk lines, not the shipments from the Western markets), and but for some discussion of the proportions of the Lackawanna's share to be assessed on the other four railroads live-stock rates would probably have been advanced ten days ago. It is safe to say that the loss in net earnings, because of this delay for 10 days, has been twice as great as the difference that would be made in a whole year's net earnings by any possible difference in assessing the Lackawanna's share on the other roads. The entire profits on this business have been sacrificed since June, and at a reasonable rate it would yield the railroads altogether

something like \$4,000,000 net per year. Every day of delay in restoring rates, therefore, costs them more than \$10,000, and nearly half of this falls on the Eastern trunk lines. At a meeting last Wednesday it was agreed to make the rate next Monday 40 cents for live stock and 70 for dressed beef.

#### October Earnings.

Our table of railroad earnings in October published this week has reports from 80 railroads—a larger number than usual—whose aggregate mileage and earnings and average earnings per mile this year and last were:

	1884.	1883.	Inc. or Dec.	P. c.
Miles.....	54,471	52,417	+ 2,054	3.9
Earnings.....	\$33,593,506	\$36,263,541	— \$2,669,035	7.4
Earn. per mile.....	617	692	— 75	10.8

In spite of the addition of 2,054 miles of road there was a large decrease in total earnings, while the average earnings per mile fell off 10½ per cent.

We may compare this with the percentages of decrease in previous months, as follows:

	March.	April.	May.	June.	July.	Aug.	Sep.	Oct.
10.8 (Inc) 11.5	2.8	10.9	7.5	12.1	10.2	10.8		

Thus the percentage of decrease was a little greater in October than September, considerably less than in August, nearly the same as in June and March, and much more than in April (when, indeed, there was a slight increase) and May. The figures, in fact, do not indicate for the country at large any considerable change in October.

The report is noticeable for the large number of railroads in the Far West that report. Heretofore the Central Pacific (which has published its reports regularly through good and bad times from in the beginning) has often stood alone in our table, or with only one other. For October the Denver & Rio Grande, the Denver, Rio Grande & Western, the Oregon & California, and the Utah Central report also. None but the last of these had reported before for months. Now the railroads of this territory report more completely than those of any other, for we have also the Northern Pacific, reported in another group, and the Atchison, Topeka & Santa Fe and the Union Pacific also report, though too late for our table. There are few other railroads of importance in the territory west of Missouri and Kansas.

The four that report for October with a decrease of 2.7 per cent. in their aggregate mileage show a decrease of 14.7 per cent. in their earnings, and their earnings per mile fell from \$655 to \$574, or 12.3 per cent. Every one of these roads shows a decrease in total earnings; on the Denver & Rio Grande it is 20 per cent., on the Denver, Rio Grande & Western 23.2 per cent., on the Oregon & California 30.9 per cent. The Denver & Rio Grande earned \$400 per mile, which is as much as many solvent roads make, but its expenses usually absorb all but a small part of its earnings. The Denver, Rio Grande & Western earnings per mile were but \$240, and those of the Oregon & California \$258.

The four roads northwest of St. Paul all had an increase in total earnings, but only the St. Paul & Duluth and the Manitoba had an increase in earnings per mile, though the decrease of the Northern Pacific was insignificant. On all of these roads the total earnings last October were larger than they have ever been before in a single month. In successive months their aggregate gains and losses compared with last year have been:

March.....	Inc. \$97,442	July.....	Inc. \$156,330
April.....	Inc. 74,173	August.....	Inc. 114,499
May.....	Inc. 359,949	September.....	Inc. 182,178
June.....	Inc. 147,669	October.....	Inc. 291,218

Their gain was thus larger in October than in any other month since May. It should be said that the increase in mileage of late months has been much less than before, so that the same gain now indicates greater improvement than it did in the spring or summer.

The 14 railroads west and northwest of Chicago had aggregate mileage and earnings and average earnings per mile as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Miles.....	14,455	13,865	+ 590	4.2
Earnings.....	\$7,718,390	\$8,233,007	— \$514,617	6.3
Earnings per mile.....	534	594	— 60	10.1

The average result is not quite so bad as for the whole number of railroads reporting, but not much different. Four of the 14 roads show some increase in total earnings, but only two of these have an increase in earnings per mile. More than half of the whole decrease was on the Chicago & Northwestern. The great decreases in earnings per mile are 64 per cent. by the Marquette & Ontonagon, 37 by the Green Bay & Winona (earnings but \$132 per mile), and 25 by the Milwaukee, Lake Shore & Western.

Thirteen of these roads have had the following aggregate decreases in successive months:

March.....	\$703,270	July.....	\$101,281
April.....	Inc. 156,405	August.....	628,757
May.....	18,291	September.....	477,685
June.....	379,036	October.....	554,787

The very large decrease in March was due to extraordinarily large earnings last year. Since July the decreases have become very large again, less in October than in August, but more than in September. September, October and November are usually the best months in the year for these railroads. It should be remembered that nearly all of them made gains last year in October, and some of them very large ones. Eleven of them that reported last year earned \$645,444 more than in 1882, and now \$518,006 less than in 1883. But these 11 roads were working 11,787 miles in 1882 and 13,368 this year. The increase of \$127,438 since 1882 does not begin to pay the cost of working the additional 1,581 miles of road, not to say the interest on its cost.

West and southwest of St. Louis seven railroads report for October, excluding the great Gould system, and indeed



the most important of the other railroads in Texas, as the Houston & Texas Central and the Galveston, Harrisburg & San Antonio, but including the Texas & St. Louis, which has not usually reported. Of the roads which do report all but two Texas roads, the Ft. Worth & Denver and the Gulf, Colorado & Santa Fe, show an increase in earnings. Three of them are Kansas and Missouri roads, which have much to make them prosperous. But as there were fine crops for them to carry last year it seems remarkably favorable to find a gain of 10 per cent. in earnings per mile on the Fort Scott & Gulf, and 32½ on the St. Louis & San Francisco. The gain of 16½ per cent. by the Texas & St. Louis leaves it with only \$182 per mile, and the Vicksburg & Shreveport, with a large increase in total earnings, has a large decrease in earnings per mile.

Gains and losses of some of these roads for five months have been.

	June	July	Aug.	Sept.	Oct.
Ft. W. & D. ....	\$20,400	\$22,436	\$4,532	\$4,389	\$3,065
G. C. & S. F. ....	-11,372	-39,741	-55,674	-40,547	-53,593
K. C., Ft. S. & G. ....	+59,765	+48,997	+9,008	+11,729	+19,230
St. L. & S. F. ....	+17,059	+19,431	+13,936	+14,064	+14,944
St. L. & S. F. ....	+73,068	+87,338	+63,407	+77,950	+132,006
Vicks., S. & P. ....	+4,542	+10,233	+16,148	+15,381	+19,278

The gains of the Fort Worth & Denver have been transformed into losses, and the losses of the Gulf, Colorado & Santa Fe have become larger than they were. The gains of the Fort Scott & Gulf continue, but are smaller; but the large gains of the St. Louis & San Francisco in the summer became extraordinarily large in October, and those of the Shreveport line increase.

There are reports from 17 railroads north of the Ohio River, west of Pennsylvania and east of the Chicago & Alton Railroad, excluding the most important ones in this territory, and nearly all those with a heavy through traffic. The 17 that do report have a trifling increase in mileage, an increase of 11 per cent. in aggregate earnings, and a decrease from \$606 to \$536 (11.6 per cent.) in average earnings per mile, which is a little more than the average decrease for the whole country. There are five roads that earned more than last year, but of these the Chicago & Eastern Illinois and the Evansville & Terre Haute earned less than in 1883, and all the gains were smaller in amount. Of the roads that carry considerable through freight at trunk line rates, the Alton & Terre Haute Main Line had a decrease of 5 per cent., the Ohio & Mississippi a decrease of 13½ per cent., the Cincinnati, Washington & Baltimore a decrease of 10 per cent., the Indiana, Bloomington & Western a decrease of 4 per cent.—only one as much as the average decrease of all the railroads of the country that report. The gains or losses in each of the last five months of some of the more important of the railroads in this group have been:

	June	July	Aug.	Sept.	Oct.
Cin., Ind. ....	\$2,013	\$21,700	\$15,683	\$3,308	\$9,004
St. L. & C. ....	-27,304	-6,921	-21,548	-31,076	-19,044
Flint & P. M. ....	-27,512	-13,279	-29,118	-32,305	-70,835
Ill. Cen. ....	-26,709	-65,695	-104,069	-157,920	-159,647
Ind. Bloom. ....	-20,561	-36,375	-36,375	-11,322	-10,823
Ohio & Miss. ....	-41,500	-50,091	-104,504	-101,161	-59,089
Alt. & T. H. ....	+1,272	-18,283	-38,160	-25,364	-6,029

Only two of these roads had a larger loss in October than in any other of the five months—the Flint & Pere Marquette and the Illinois Central. The latter's large loss (15 per cent.) was very little more than in September; and the great decrease (30½ per cent.) of the Pere Marquette little more than offset its great increase last year, so that it earned but \$12,122 (6 per cent.) less than in 1883. Other roads have much smaller losses in October than in some previous months, including all those with a trunk-line traffic. Considering the circumstances, the report is less unfavorable than was to be expected. The roads in this territory that reported last year had nearly the same earnings per mile then as in 1882.

South of the Ohio and the Potomac and east of the Mississippi there are 22 roads reporting, whose aggregate mileage and earnings and average earnings per mile were:

	1884.	1883.	Inc. or Dec.	P. c.
Miles.....	10,323	10,107	+216	2.1
Earnings.....	\$4,650,470	\$5,083,329	-\$432,859	8.6
Earn. per mile.....	450	503	-53	10.6

The decrease in earnings per mile here is nearly the same as the average of all the roads reporting. Only five of the 22 roads have any increase in total earnings, and only four an increase in earnings per mile. Of these the New Orleans & Northeastern, which had not been opened through in October last year, not only has a large increase, but its earnings per mile (\$410) were quite respectable for an old Southern road—more than those of the Alabama Great Southern (of which it is an extension) or the East Tennessee, or the Mobile & Ohio, or the Nashville & Chattanooga. Last year the Southern roads generally showed a large increase in earnings in October. Nineteen roads which reported both years gained \$498,542 last year, and lost \$510,102 this year, so that they earned very nearly as much this year as in 1883, which was the year of the largest crops ever known in the South. Among roads whose earnings this year in October were larger than in 1883 are the Alabama Great Southern (24 per cent.), the Lexington & Big Sandy (14 per cent.), the Kentucky Central (14 per cent.), the Louisville & Nashville (6½ per cent.), the Nashville & Chattanooga, the Richmond & Danville (2 per cent.), the Virginia Midland, the Western North Carolina, the Shenandoah Valley, and the Vicksburg & Meridian. As these roads had for the most part larger earnings in 1883 than in any previous year, the earnings this year cannot be considered had, though so much less than

last year. The increase in mileage has not been great. The gains and losses of a few of these roads in each of the last five months have been:

	June	July	Aug.	Sept.	Oct.
Ches. & Ohio.....	\$65,045	\$8,175	\$30,391	\$59,106	\$115,947
Cin. South.....	3,336	7,998	9,465	2,279	22,830
E. Tenn., Va. ....	+35,151	-12,960	-60,859	-25,123	-43,303
Louisville & Nashville.....	50,021	51,775	-128,067	-182,459	-210,995
Mobile & O. ....	6,517	6,049	-14,230	-27,317	-43,094
Nash., Chat. ....	8,704	7,993	1,532	12,780	2,417
Nor. & West.....	19,741	-33,364	-31,712	-17,192	-42,715
Rich. & Dan. ....	6,872	-21,350	-24,447	-24,905	-655
S. Carolina.....	7,477	-15,789	-21,136	-23,232	-11,057

Five of these roads had a larger decrease in October than in any previous month.

The 11 Eastern railroads (east of Ohio) that report have the following aggregates:

	1884.	1883.	Inc. or Dec.	P. c.
Miles.....	8,084	8,473	-389	-4.6
Earnings.....	\$10,493,701	\$11,077,356	-\$583,655	-5.3
Earn. per mile.....	1,291	1,308	-17	-1.3

The decrease per mile is greater than the average and greater than in any other section. There are large percentages of increase by two small roads, and small gains by three others; but the great roads all have a decrease, which is a large percentage for great roads. Nearly half of the whole loss falls to the Reading, whose decrease is one-sixth.

The decrease of 15 per cent. on the Grand Trunk and of 12 per cent. on the Pennsylvania and the Northern Central may be in part ascribed to the bad condition of trunk line business. We have in this table for the first time the earnings of the New York, Ontario & Western, at the rate of \$457 per mile both years, which is very light for a New York railroad. Ten of these roads (all but the Ontario & Western) have had the following aggregate decreases in successive months:

June.	July.	August.	September.	October.
\$1,000,850	\$375,716	\$534,370	\$787,833	\$1,243,015

Thus their aggregate loss was greatest in October. All that reported last year showed a gain over 1882, but it was much less than this year's loss. The gains and losses of the several roads in successive months have been:

	June	July	Aug.	Sept.	Oct.
Hooaac Tunnel.....	\$11,260	\$12,659	\$12,774	\$11,943	\$10,730
Eastern.....	9,386	11,557	13,155	2,038	10,082
Grand Trk. ....	-220,169	-94,527	-109,071	-182,411	-189,455
Long Isl'd. ....	8,477	11,174	7,546	-37,763	-5,915
N. Y. Sus. ....	5,182	7,828	2,191	4,732	5,016
Northern Central.....	-59,529	2,992	-76,845	-68,016	-70,953
Pennsylvania.....	-250,697	-141,865	-157,486	-176,127	-427,801
Phila. ....	-601,720	-211,303	-239,019	-459,768	-590,895
Reading.....	49,362	47,752	43,307	23,508	34,142
West Jersey.....	3,676	385	7,381	20,474	4,028

The Boston, Hooaac Tunnel & Western has made steady gains varying little from month to month. The Eastern's loss was largest in October. The decrease on the Grand Trunk was a little larger in October than September and the largest since June. The Long Island lost less than in the summer months. The Northern Central lost more than in any other month except August, but the changes are slight in the last three months. The Pennsylvania's decrease was the largest of the year.

Altogether the report does not indicate that earnings have been generally growing worse since July. In some sections they have been—in the South and in Texas. The railroads northwest of St. Paul have been gaining, and so have those directly west of St. Louis in Missouri and Kansas, so far as they have reported. The roads west and northwest of Chicago have had greater losses since July than before, and they have been large, but they do not grow larger. In the East the losses have been growing greater steadily since June.

#### Pennsylvania Railroad Earnings in October.

The report of the Pennsylvania Railroad for October for the line east of Pittsburgh and Erie shows a larger decrease in gross earnings than in any other month of the year, and a larger decrease in net earnings than in any other month except February. It is to be remembered, however, that the gross earnings last year in October were larger than in any other month in the history of the road, and the net earnings the largest with one exception.

For 19 successive years the gross and net earnings and working expenses of the lines east of Pittsburgh and Erie in October have been:

	Gross earnings.	Expenses.	Net earnings.
1873.....	\$3,757,511	\$2,132,285	\$1,625,226
1874.....	3,482,587	2,040,548	1,442,039
1875.....	3,272,567	1,839,433	1,433,134
1876.....	4,004,429	1,821,278	2,183,151
1877.....	3,210,078	1,704,704	1,505,374
1878.....	3,215,417	1,653,871	1,561,546
1879.....	3,518,144	1,832,214	1,685,930
1880.....	3,682,715	1,688,394	1,994,321
1881.....	3,672,971	2,317,930	1,355,041
1882.....	4,060,053	2,632,341	1,427,712
1883.....	4,875,345	2,659,197	2,216,148
1884.....	4,447,544	2,524,844	1,922,700

Compared with last year, the decreases are:

	Gross earnings.	Expenses.	Net earnings.
Amount.....	\$427,801	\$134,353	\$293,448
Per cent.....	8.8	5.0	13.2

The gross and net earnings were also less than in 1882, but larger than in any previous year except that the net earnings were larger in the Centennial year.

The result of the operation of the lines west of Pittsburgh and Erie in October has been the following surplus over all liabilities for interest, rentals, etc., for the last six years:

1879.	1880.	1881.	1882.	1883.	1884.
\$593,182	\$418,170	\$309,894	\$313,200	\$268,893	\$131,487

The decrease from last year in this profit was thus \$137,406, and it is smaller than in any other year of the six.

Adding this surplus to the net earnings of the system east of Pittsburgh and Erie, we have as the income of the Pennsylvania Railroad Company from both systems:

1879.	1880.	1881.	1882.	1883.	1884.
\$2,279,112	\$2,100,564	\$1,661,926	\$2,550,921	\$2,485,041	\$2,051,187

Thus the profits of the company in October were less this year than in any other since 1878, except 1881, during the great railroad war, which then ruined the value of all through traffic, freight and passenger, in both directions. The decrease since last year is equal to nearly ½ per cent. on the company's capital stock.

For the ten months ending with October, earnings and expenses have been for nine years:

	Gross earnings.	Expenses.	Net earnings.
1876.....	\$30,343,263	\$18,716,426	\$11,626,837
1877.....	25,216,296	15,793,302	9,422,994
1878.....	29,035,337	15,189,777	13,845,560
1879.....	28,034,350	16,655,316	11,379,034
1880.....	34,137,327	20,022,630	14,114,697
1881.....	31,552,212	21,801,374	9,750,838
1882.....	40,548,834	24,933,620	15,615,214
1883.....	42,769,257	25,473,559	17,295,698
1884.....	40,846,647	25,378,685	15,467,962

Compared with last year the decreases are:

	Gross earnings.	Expenses.	Net earnings.
Amount.....	\$1,922,610	\$1,094,874	\$827,736
Per cent.....	4.5	4.1	5.1

The decreases are large in amount, yet but small percentages. The gross earnings and working expenses continue slightly more than in 1882; the net earnings are now slightly less.

The surplus of net earnings over all liabilities, or the deficit in covering the same, of the lines west of Pittsburgh and Erie, has been for six years:

1879.	1880.	1881.	1882.	1883.	1884.
Surplus.	Surplus.	Surplus.	Surplus.	Surplus.	Deficit.
\$762,918	\$2,514,735	\$2,578,977	\$1,550,981	\$1,163,211	\$518,536

Thus in each of the five years previous to this year there has been a surplus, but this year a deficit of more than half a million resulting from the working of this western system, and the decrease from last year is no less than \$1,681,247 which is twice as much as the decrease in the net earnings of the eastern system, while the decrease from 1880 and 1881 is more than \$3,000,000.

Adding the surplus to and subtracting the deficit from the net earnings of the eastern system, we have the following as the profit of the company from both systems for the ten months:

1879.....	\$12,081,058	1882.....	\$17,220,105
1880.....	16,694,432	1883.....	17,458,900
1881.....	17,329,515	1884.....	14,049,920

Thus the profits from the two systems are \$2,509,000 less than last year, equal to more than 2½ per cent. of the present capital stock, and \$2,383,000 less than in 1881, which is 3 per cent. on the capital stock then outstanding.

The condition of both traffic and rates in October was such as to make a large decrease in profits probable. The decrease was smaller rather than larger than was to be expected. There was no improvement in either traffic or rates in November, but the company's earnings last year were not so exceptionally large in that month as in October, so that the comparison may be less unfavorable this year.

#### October Accidents.

Our record of train accidents in October contains brief notes of 48 collisions, 54 derailments and 3 other accidents; 105 accidents in all, in which 39 persons were killed and 170 injured.

Ten collisions, 12 derailments and 1 other accident caused death; 16 collisions and 12 other accidents caused lesser injuries. In all 23 accidents caused death and 28 injuries, but not death, leaving 54 accidents, or 51½ per cent. of the whole number, in which there was no personal injury serious enough for record.

Thirty-three of the killed and 77 of the injured were railroad employees, who thus furnished 53 per cent. of all the casualties. In the 48 collisions 11 persons were killed and 74 hurt; in the 54 derailments 26 were killed and 96 injured, and in the 3 other accidents 2 were killed.

As compared with October, 1883, there was a decrease of 69 accidents, of 4 killed, and of 64 injured.

These accidents may be classed as to their nature and causes as follows:

	Collisions.	Derailments.	Other accidents.
Rear.....	29		
Butting.....	15		
Crossing.....	4		
Broken rail.....		3	
Broken frog.....		1	
Broken switch-rod.....		2	
Broken bridge.....		3	
Spreading of rails.....		2	
Broken wheel.....		1	
Broken axle.....		1	
Broken draw-head.....		1	
Accidental obstruction.....		3	
Cat's paw.....		3	
Wash-out.....		3	
Misplaced switch.....		10	
Purposely misplaced switch.....		1	
Rail purposely removed.....		3	
Malicious obstruction.....		2	
Unexplained.....		15	
Boiler explosion.....			1
Cars burned while running.....			1
Loose door on freight car.....			1
Total.....	48	54	3

Six collisions were caused by misplaced switches; three by mistakes in orders or failure to obey them; two by trains breaking in two; two by cars run out of sidings upon the main line; one each by fog, by failure to use signals and by a runaway engine.

One of the broken bridges failed because it had been weak-



ened by fire, the wooden stringers being partly burned through just before it gave way.

A general classification of these accidents may be made as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road.....	2	10	2	14
Defects of equipment.....	2	4	2	8
Negligence in operating.....	43	10	1	53
Unforeseen obstructions.....	3	0	1	4
Maliciously caused.....	6	6	6	18
Unexplained.....	15	15	15	45
Total.....	48	54	3	105

Negligence in operating was thus the chief general cause, covering 51½ per cent. of all the accidents recorded.

A division according to classes of trains and accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains.....	3	15	1	19
To a pass. and a freight.....	19	1	1	21
To freight trains.....	26	39	2	67
Total.....	48	54	3	105

Accidents are thus recorded to a total of 153 trains, of which 41, or 27 per cent., were passenger trains, and 112, or 73 per cent., were freight trains.

Of the total number of accidents 66 are recorded as happening in daylight and 39 at night.

The month does not call for special remark, except to note the large proportion (46 per cent.) of collisions. Misplaced switches appear in full force, causing 6 collisions and 10 derailments, 16 accidents in all, or more than one-seventh of the whole number. There was an unusual number of malicious derailments, six in all, three of them being caused by removal of rails, one by misplacing a switch and two by obstructions placed on the track.

For the year ending with October the record is as follows:

	Accidents.	Killed.	Injured.
November.....	122	34	235
December.....	112	32	113
January.....	147	36	240
February.....	110	22	150
March.....	115	26	112
April.....	88	19	168
May.....	73	32	150
June.....	71	40	103
July.....	89	25	142
August.....	80	38	112
September.....	100	21	174
October.....	105	39	170
Total.....	1,224	384	1,869
Total, same months, 1882-83.....	1,679	472	1,903
" " " " 1881-82.....	1,376	401	1,466
" " " " 1880-81.....	1,492	397	1,687

The yearly average for the four years was 1,443 accidents, 414 killed and 1,731 injured. Last year was below the average except in the number killed.

The average per month for the year was 102 accidents, 32 killed and 156 injured. October was above the average in all respects.

The averages per day for the month were 3.39 accidents, 1.26 killed and 5.49 injured; for the year they were 3.34 accidents, 1.05 killed and 5.11 hurt.

The average casualties per accident were, for the month, 0.371 killed and 1.639 injured; for the year, 0.314 killed and 1.527 injured.

#### October Grain Receipts at New York.

The New York grain receipts in October were a trifle greater than in September, when they were much larger than in any other month of the year, but less than in October of last year. For ten successive years the New York receipts in October, including flour, have been, in bushels:

Year.	Bushels.	Year.	Bushels.
1875.....	12,563,801	1880.....	19,556,542
1876.....	12,277,125	1881.....	11,356,056
1877.....	17,623,580	1882.....	13,743,800
1878.....	20,328,761	1883.....	16,052,119
1879.....	22,788,675	1884.....	14,658,722

Thus the receipts this year were about 9 per cent. less than last year, 6½ per cent. more than in 1882, 29 per cent. more than in 1881, 25 per cent. less than in 1880, and 35½ per cent. less than in 1879, when they were largest. The very large decrease compared with the four years from 1877 to 1880, inclusive, is remarkable.

The proportion carried by rail and canal in these several years has not changed in favor of the railroads as most people seem to suppose, especially when we exclude flour, which the canal does not carry at all. Thus the percentages of grain and flour, and of grain alone, carried by rail and by canal in October for the last eight years has been:

Year.	Grain and flour.		Grain alone.	
	By rail.	By canal.	By rail.	By canal.
1877.....	38.5	60.0	30.0	69.9
1878.....	29.1	69.8	19.0	80.3
1879.....	44.0	53.9	36.0	61.3
1880.....	37.8	58.8	30.4	69.5
1881.....	64.5	34.2	56.8	42.6
1882.....	50.0	48.7	36.9	62.5
1883.....	45.3	53.1	34.4	64.6
1884.....	44.6	54.2	31.7	67.6

Thus, the proportion of the grain and flour arriving by rail in October was smaller this year than in any other since 1880, and of grain, excluding flour, the proportion brought by rail this year was the smallest since 1878, with exception of 1880. The proportion of wheat ground in the West before shipping to the East has increased greatly since 1880; flour had been 12 to 14½ per cent. of the total New York receipts until 1891; for the last four years it has been 17½ to 22 per cent., being larger in amount in these years when the total receipts have been so much smaller than before 1881. The actual amount of rail receipts of grain alone was much less this year than last, having been:

Year.	Bushels.	Year.	Bushels.
1877.....	4,521,727	1881.....	5,131,478
1878.....	3,461,308	1882.....	3,958,485
1879.....	7,411,095	1883.....	4,556,494
1880.....	5,245,002	1884.....	3,725,606

Thus there is but one year of the eight (1878) when the

amount of grain delivered at New York by the railroads in October was less than this year.

The deliveries by canal have been less in but two years. They have been in October:

Year.	Bushels.	Year.	Bushels.
1877.....	10,517,315	1881.....	3,888,310
1878.....	14,149,827	1882.....	6,089,718
1879.....	12,291,623	1883.....	8,525,300
1880.....	11,511,808	1884.....	7,951,309

Since last year the shipments by rail have decreased 831,000 bushels; the shipments by canal, 574,000. Since 1882 there is a decrease of 232,000 by rail and an increase of 1,262,000 by canal. Thus the changes in recent years have been favorable to the canal and unfavorable to the railroads. Indeed, it has been more unfavorable to the railroads than the above figures indicate, because two new lines have been opened to share the reduced traffic with the three old ones, which formerly had substantially the whole of it. It is true that they have not taken a great amount of grain, but the small amount they took was about 18 per cent. of the whole that came by rail. The New York Central had a large share of the grain last October, yet its deliveries at New York amounted to but 1,691,621 bushels then, against 3,770,980 in 1879; the Erie (whose share was unusually small this year, however) brought but 824,125 bushels, against 2,209,150 last year, and 2,895,339 in 1879. The total rail receipts of grain and flour, and the percentage by each road, in October for eight years have been:

Year.	Rail recs.	Per cent. delivered by—				
		N. Y. Cent.	Erie.	Pa.	Lack.	Other
1877.....	6,781,114	57.6	33.0	9.1	0.3	0.3
1878.....	5,916,918	53.4	26.6	19.7	0.3	0.3
1879.....	10,020,861	50.0	36.5	13.2	0.3	0.3
1880.....	7,393,117	57.2	31.1	11.3	0.4	0.4
1881.....	7,322,076	43.2	37.6	19.0	0.2	0.2
1882.....	6,876,407	44.2	31.4	23.8	0.0	0.0
1883.....	7,900,774	34.2	45.1	15.1	6.9	0.7
1884.....	6,530,526	41.5	22.8	16.3	7.6	11.8

The total this year is the smallest since 1878, but only in 1879 were the rail receipts much greater, the increase in flour of late years going far toward balancing the decrease in grain. As it may be assumed that the whole increase in receipts by "other roads," was by the West Shore, we shall credit it with one-ninth of the whole, amounting to 627,000 bushels. The 18.7 per cent. carried by the two new roads this year seems to have come chiefly from the Erie. Last year that road had an abnormally large share of the grain in October and for several other months, obtained chiefly at the expense of the New York Central; but this year it is further behind than it was ahead last year. Taking the three old roads the percentage of the aggregate receipts by the three carried by each one was:

	1879.	1880.	1881.	1882.	1883.	1884.
N. Y. Cen.....	50.2	57.5	43.3	44.5	37.0	51.5
Erie.....	36.8	31.2	37.7	31.6	46.6	28.3
Peoria.....	13.2	11.3	19.0	23.9	16.4	20.2

This shows, what we said before, that the Erie suffered most this year by diversion of grain traffic. In 1878, its proportion of the receipts by the three roads was a little less than this year (26.7 per cent., against 28.3), but in no other recent year has it had so small a part of the business.

As we have said before, the rail grain receipts at New York afford no railroad now a very large amount of earnings. The receipts in October, perhaps 170,000 tons, at full rates would have yielded \$850,000 from Chicago and less than half that amount from Buffalo or Pittsburgh. The road with the largest business brought less than 70,000 tons, which would have yielded it about \$160,000 if rates had been maintained, but which actually probably yielded less than \$125,000.

If this were all it would hardly be worth following, but the New York city receipts are not the whole of the grain movement, by any means. There is besides that and the movement to the other seaboard cities a very large movement to interior towns of the Eastern states; and the movement to New York, the chief exporting city, is of considerable significance with regard to the general condition of business in the country.

The exports of British rails to this country last October were again insignificant. For six years they have been:

Year.	1879.	1880.	1881.	1882.	1883.	1884.
	6,452	17,665	19,308	23,642	5,599	351

For the ten months ending with October these exports have been:

Year.	1879.	1880.	1881.	1882.	1883.	1884.
	28,413	188,286	259,672	183,633	59,470	16,476

The exports have been this year a little more than one-sixteenth of what they were in 1881, and not one-eleventh of what they were in 1880. Yet the consumption has doubtless been greater than in 1880, in spite of a decrease in the new construction, for we had more than 149,000 miles of track to maintain at the beginning of this year, against 108,000 miles about the middle of 1880. There must be an enormous consumption of rails for the maintenance of 150,000 miles of track, and they are now substantially all supplied by our own mills.

Philadelphia has this year made a considerable gain in petroleum exports, at the expense of New York. Down to Nov. 22, the exports from New York had decreased, compared with last year, 46,850,000 gallons, or 11½ per cent., while the exports of Philadelphia had increased 36,504,000 gallons, or 52½ per cent. These are the largest exports ever made at Philadelphia, where the exports had been decreasing for some years. Its proportion of the total exports was 22.6 per cent. this year, against 14.7 per cent. last year, 17.5 in 1883 and 21.2 in 1881. New York exported 73.1 per cent. this year, 52.5 in 1883, 76.3 in 1882, and 72.7 in

1881. The total exports are nearly the same this year as last (about ⅓ per cent. less) and larger than in any previous year. The competition of the Russian petroleum seems to have had no other effect so far than to prevent a rapid increase in our exports. These have changed little for four years, being, down to Nov. 22, 453.7 millions of gallons in 1881, 447.5 in 1882, 472 in 1883, and 469.2 millions this year. The production in Russia has increased rapidly, from 320,000 tons of crude oil in 1878 and 490,000 in 1881 to 800,000 in 1882, which latter is equivalent to about 216,000,000 gallons. This is very deceptive however, for the Russian crude oil is a very heavy oil, producing only 27 per cent. of illuminating oil, and as much as 44 per cent. of lubricating oil, while we get 70 to 75 per cent. of kerosene from our petroleum. Thus the 216,000,000 gallons of Russian petroleum in 1883 yielded actually but 56,000,000 gallons of kerosene. This latter amount is about one-tenth of our exports for a year, although it is 6,200,000 gallons more than the Russian production in 1881, and 15,300,000 more than the production in 1880. Comparatively little of the Russian kerosene is consumed out of Russia and some Asiatic countries, but the lubricating oil, which is said to be better than that made from American petroleum, is used largely in Europe, and grows in favor. An oil used only for fuel is made from the Russian petroleum. It is this fuel oil, forming 14 per cent. of the petroleum, and not petroleum itself, which is used so extensively as fuel on and around the Caspian Sea, a country destitute of both wood and coal. All the steamers on the Caspian (there are hundreds of them) use it, and those on the Volga engaged in carrying oil, and it is used to some extent also on locomotives. One ton of this waste is said to be equal to three tons of coal, a statement which may be taken with a grain of allowance. Our petroleum, which in the oil regions is sometimes not much dearer, pound for pound, than coal, has not been found to be an economical fuel for ordinary purposes.

The Russians carry their petroleum a few miles from the wells to their refineries on the banks of the Caspian, and thence nearly the whole of the Russian supply goes in steamers fitted with tanks across the Caspian to the mouth of the Volga, where it is transferred to river steamboats and barges, which take it up the Volga to a railroad crossing at Zaritsin, where there are great storage tanks, and whence it is distributed in tank cars all over Russia and to some extent in Eastern Germany, etc. Since the completion of the railroad between the Caspian and Black seas, considerable shipments have been made over it, chiefly for the supply of Turkey, of the Black Sea ports of Russia, of the Danubian and Mediterranean countries. In 1883, however, only 10,840,000 gallons went over this road; more than a quarter of it in the last month of the year.

The Russian production must increase immensely before it can have much effect on the demand for our petroleum, or rather for our kerosene, for the Russian lubricating oil may drive ours entirely out of the European market, especially if there is much increase in the production of the Russian wells, as for every million of gallons of illuminating oil they afford 1,630,000 gallons of lubricating oil. If there was a similar proportion of heavy lubricating oil in our petroleum, the whole world would hardly afford a market for it.

There was a great increase in the corn receipts at the Northwestern markets in the third week of November, which may indicate the beginning of the new crop movement, though it is very early for that. Since September the average weekly receipts had been 1,090,000 bushels and in the second week of November 1,149,000; in the third week they were 1,759,000 bushels. There was an increase at every corn market, but chiefly at Chicago. It received 61.3 per cent. of the whole and Peoria 18.7. St. Louis, which might be expected to feel the new crops first, received less than 8 per cent. of the whole. The reports so far indicate a further increase in the fourth week of November, to 2,100,000 bushels or more.

The prices of New York-Chicago tickets have suffered little change for nearly two weeks, ranging apparently between \$8 and \$9.50. The West Shore has imposed upon itself two tasks, which seem the chief cause of fluctuations now. One of these is to keep its rate \$1.50 below the New York Central rate, and the other to sell as low as the scalpers. The latter are no longer happy. Commissions, when paid at all, are very small; and the concessions they can make on Chicago tickets are so small that the passengers are likely to buy at the offices of the railroad companies, and not of the scalpers. They do better with unused coupons from Buffalo to Chicago. Some efforts have been made to restore rates as far as that is possible with a \$4.65 rate from New York to Buffalo, but the New York Central, it is said, objects to doing anything until the local as well as through rate is restored.

The Chicago railroads at the beginning of last week advanced the rate on lumber to Missouri River points, but only to 10 cents per 100 lbs., which is as low as the lowest cut rate previous to this fall, we believe. The regular rate when the cutting began was 18 cents. The drop was first to 10 cents, which has occurred frequently before, and it was probably to make short work of it that a further reduction to 5 cents was made. This latter rate seems to have had the effect of giving the market to the Chicago lumbermen, and enormous quantities were forwarded while the rate lasted, especially by certain great shippers who have branch yards at Kansas City, etc. The shipments have been so great that it is not thought that the country west of



the Missouri will want any more lumber before spring, one of the results of which will be that an unusually large proportion of the cars carrying the heavy winter shipments of corn and hogs to Chicago will have to go back empty; while during the prevalence of the rate it was impossible to get cars enough to meet the demand, and probably some of the cars that went west with lumber had to return empty. Thus not only have the railroads reduced their revenues by making a 5-cent rate, but they have increased their expenses above what they would have been if the shipments had been made at the ordinary rate. Moreover, they have displeased some at least of their customers. Some of the smaller yardmen complain that the rate was advanced before they could lay in their stocks, and now they must compete with the great dealers who have had an advantage of something like \$1.50 a thousand in the freight.

Mr. E. St. John, General Ticket and Passenger Agent of the Chicago, Rock Island & Pacific Railway, publishes a long rejoinder to the "joint reply" of the Milwaukee & St. Paul, the Northwestern and the Burlington, a summary of which we published last week. This reply contains correspondence between himself and Mr. James Charlton, of the Chicago & Alton, in which Mr. Charlton gives evidence as to proceedings at the September meeting and the February meeting. The agreement at the latter meeting required that notice of any violation of the agreement should be given not later than 5 p. m. of the day following the violation, and that meetings for investigating charges must be held not later than five days after the commission of any offense. No charges were ever preferred against Mr. St. John under the provisions of this agreement.

The larger part of the document, however, consists of evidence of the violations of the agreement by the three companies making the joint reply. This consists of affidavits by several persons in the service of the Rock Island Company that they had purchased and traveled upon what were called "editors' 1,000-mile tickets" of the Chicago, Burlington & Quincy Railroad, "passes" for 500, 1,000 and 1,500 miles over the Chicago, Milwaukee & St. Paul, and a 1,000-mile ticket of the Chicago & Northwestern. All these tickets were on their faces not transferable, containing provisions that if presented by any other person than the one to whom issued, they would be taken up by the conductor and forfeited. Thus, while they were in form not transferable, the experience of the Rock Island employees shows that they were actually transferred, and that the conductors made no effort to ascertain whether the persons presenting them were the persons authorized by their terms to ride on them, whence it is concluded that private instructions had been issued which rendered void the restriction on the face of the tickets and so made them in fact transferable mileage tickets issued in payment for advertising, the issuing of which was a main charge against the Rock Island. A meeting in Chicago last Wednesday settled the trouble and advanced rates to \$7.50 to St. Louis, \$12.50 to Kansas City, and \$14.50 to Council Bluffs.

We have to apologize to our readers for a misprint which occurred in our summary of the Master Car-Builders Standards given on page 833 of our issue of Nov. 21. In the section relating to the "Protection of Trainmen from Accidents," the steps should be of iron measuring  $\frac{1}{2}$  in. by  $\frac{1}{4}$  in. instead of  $\frac{1}{2}$  in. by  $\frac{1}{4}$  in. as stated.

#### Record of New Railroad Construction.

Information of the laying of track on new railroads is given in the present number of the *Railroad Gazette* as follows:

*Milwaukee, Lake Shore & Western.*—Extended from Bessemer, Mich., west to Norwood, 6 miles.

*Northern Pacific.*—On the Wisconsin Division track is reported laid from Brule River, Wis., east 6 miles, and from Ashland west 7 miles.

*Oregon Pacific.*—Track is reported laid from Corvallis, Or., west 9 miles; also extended from Oneatta, Or., eastward 41 miles.

*Pine Bluff & Swan Lake.*—Extended from Corner Stone, Ark., southeast to Swan Lake, 7 miles. Gauge, 3 ft.

*Tionesta Valley.*—Extended from Garfield, Pa., to Augustville, 8 miles. Gauge, 3 ft.

This is a total of 84 miles of new railroad, making 3,509 miles reported to date for the current year. The total track reported laid to the corresponding date for 13 years past is as follows:

	Miles.		Miles.
1884.....	3,509	1877.....	1,977
1885.....	3,819	1878.....	2,177
1886.....	9,574	1879.....	1,237
1887.....	7,353	1880.....	1,767
1888.....	5,924	1881.....	3,507
1889.....	3,443	1882.....	6,885
1890.....	2,207		

These statements include main track only, no account being taken of second tracks or other additional tracks or sidings.

#### The Elements of Railroad Engineering.

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#### IV.—MAIN TRACK AND SIDINGS.

#### II. Track-men—Economizing their Time—Sidings—Frogs and Switches.

Although the better the track the fewer the men required to keep it in good order, yet a certain number will be required upon any track to look after it and to make im-

mediate repairs when needed; and, as in other work, experience is of value in the performance of the duties of a laborer on track. If he is possessed of a little judgment he will waste less time about a job than if he has none; so that old trackmen who have been under the training of a good foreman are entitled to be classed as *skilled laborers*, and a railroad company should try, by a little increase of wages and of privileges, to keep them in its service rather than to allow them to be replaced by green men. The same is true as to foremen in a greater degree. They are, indeed, everywhere paid as skilled men; yet the value to a company of a trustworthy man, who is acquainted with his section and who has learned how to keep his men well at work, and how to teach them, is not always appreciated. Such men are rare and are the most necessary to the proper maintenance of the track. It should be the aim of every trackmaster or supervisor to increase their number; for this reason, and to add to the efficiency of the track force, it is advisable to have at least two foremen in embryo, upon each section, distinguished by authority and by a small increase in wages from the other men; the higher in rank may be called assistant foreman and the other spiker. These small allowances in their pay will be well returned to any company, if the track-master has selected the promoted men with judgment. It has been found useful, as a means of discipline and of instruction, to require frequent written reports from the section foremen; they should not be too long nor relating to unimportant matters; but they may embrace all the statistics which would be useful, and convey lucid information as to any notable events which occur on the section. Printed forms containing questions to be answered assist in giving an idea of the information wanted.

It is common enough to find a severe economy as to the number of men employed, upon roads where very little attention is given to economizing their time, by providing them, for instance, with hand cars which run easily and with cold chisels which will stand to cut a rail, or draw-bars which will really pull a spike; and on such roads the working trains will generally be equipped with the least useful engines, which will get stalled in the pit or even on the main track, resulting in the loss of hours of the time of the men. A little reflection, or a brief calculation, should convince any railroad officer that such neglect involves the most useless waste. Better to pay the highest price for the hire of a serviceable locomotive, rather than to use an incompetent one for a working train. On roads where this train is required to serve at distant places, boarding cars with arrangements for lodging the men will prove very economical of their time, and will more than repay the cost of fitting up. The force may then be laid off at any siding, at night, without unnecessary running to headquarters.

It is not everywhere made one of the special duties of the trackmen to clear the road of snow in the winter, depending upon the snow-plows run by the locomotives to accomplish this; yet a force on foot, armed with shovels, can often anticipate the plow, or lend great effect to its finishing work by roughly trenching the drifted cuttings. In fact, the quickest mode of opening a badly-drifted road is by shovels rather than by locomotives. It is an excellent plan, on such a road, to authorize each section foreman to hire as many men as he can after a violent storm, to help in clearing the track. The whole neighborhood will generally assist with great cheerfulness, and the drifts will have disappeared in no time, if the wind has gone down. Immense service in clearing away the snow cheaply may be rendered on tracks not too busily occupied by traffic, by snow-plows of rough planks, such as are used for common roads, drawn by oxen. Such means are not to be despised, even on great main lines, where several locomotives frequently fail to drive through the more magnificent regulation plow on wheels. The principle of overcoming the enemy in detail, or in small detachments, is well illustrated in the successful "fighting of snow-drifts."

Whenever a siding is to be laid, leading out of a main track over which the trains run rapidly, a new source of danger is introduced into the operations of the road, and it should be a matter of grave reflection how to construct it in the manner which will involve the fewest chances of accident. The most convenient or the least expensive position for the switches may be where they will be the most concealed from the view of approaching trains; and it would be better, in the long run, to spend a larger sum for the sake of having them visible from afar, or to protect them by interlocked danger signals, at a safe distance.

In England, the risks from "facing points," that is, from switches leading out of the line from the direction in which the train is moving, were formerly regarded as so considerable, that on many roads none were permitted; any train taking the siding had to run by and back in; and although the exigencies of traffic have now compelled the use of "facing points" there, they are generally guarded by devices for locking them which insure that they are *well home*, before a train is allowed to pass.

In the United States, the enormous number of accidents occurring at switches and frogs goes to prove that a distrust of them is warranted and that we cannot guard them too carefully.

There are a few suggestions which may be borne in mind, when a siding is to be located. It is better to place it on the outside of a curve than on the inside; for, when occupied by a train, the view of the line from the main tracks will not then be obscured. The cross-overs from one main track to the other may almost always be arranged so as to avoid facing points; even if safety switches are used, it is safer to run from than against the points of the frogs. It is prudent to place switches as far from bridges or deep

ravines as the circumstances will admit, so that if anything about them were to fail, the locomotive may not certainly plunge into a gulf. When sidings are upon a grade inclined towards the main track, they should open into a safety-end by a switch which should be kept set for the safety-end, except when communication with the main track is desired; so that if cars are moved down the grade by wind or by gravity, they will not foul the main line. If the switch which leads into the safety-end is interlocked with that in the main track, so that it shall always move with it, it will avoid mistakes on the part of trainmen. This is a much safer arrangement than beams of wood or iron fastened across the siding, although even that device is better than to make no provision against one of the common causes of accident. It is often convenient, upon a road with double track, to place a siding for meeting and passing trains between the main tracks and communicating with both of them. In such a case it is best to make it long enough to accommodate two ordinary trains or, better, two of the longest trains, for they will be quite sure to reach it together. In general, however, sidings are more convenient, even for meeting points, if at the side of the main tracks; if not too far from one to the next, having in view the volume of traffic upon the road, they may be laid out alternately on one side and the other of a road with double main track, avoiding to a great extent the use of the cross-overs; for a train may wait a short time to be passed at a siding which leads out of its own track, rather than run farther and be delayed by crossing over the other main track and back again. It is in favor of outside sidings, that others can be led out from them without adding to the number of switches in the main track. Sidings upon the passenger side of the tracks should stop short of the passenger station, say 200 ft. if possible, never passing before it, if avoidable. Although 6 ft. has been the standard width between the adjacent rails of contiguous tracks, a greater width is very desirable on many accounts. The latest instance of a double track road has 8 ft. between the main tracks. Unless parallel sidings are to be used for transferring freight from car to car, a greater width than 6 ft. should be taken, if possible. It is generally desirable to have a bunting post or some other kind of a stopper at the ends of stub tracks, although where they are not too long for the engineer and trainman to communicate easily together, as in passenger yards, the absence of any stopper is an effectual restraint upon careless shunting. The very best stop, where there is room, is a bank of gravel or cinders, about two feet deep, across the track; and it may be given a neat appearance by walling it in on the sides and rear. Iron brackets gripping the rails are the neatest, however, and occupy least room.

It is impossible to touch upon frogs and switches without also touching upon inventors; yet there are general principles to which they must conform to reach the best results. For instance, as to frogs; no doubt the best are made from steel rails; no doubt the best mode of fastening them together is by clamps and keys, so far as possible, instead of by bolts; no doubt that the rails should be worked in the planer instead of in the fire, at least in the present state of the art; no doubt that a frog for the main track should have a spring rail on the outside, to avoid the jar which is otherwise caused in passing over it at high speed. In yards, where the trains take first one track and then another, and at low speed, the movable wing rails may not be worth their extra cost. Opinions vary as to the most desirable angles to be used; it is common to use a less angle (a higher manufacturer's number) in turning out of the main line than is used in the yards. In frogs, as in almost all things used on a railroad, it is best to have a few fixed standards; the supply to be carried for repairs will be thereby much reduced. The safe use of a frog requires a guard rail, which should be strongly braced opposite the frog point, not relying upon spikes to hold it in place, as is often done. New roads will find it convenient and economical to have them furnished with the frogs, as they require to have a part of the flange cut away, and this is better done by the planer than by the cold chisel.

The standard switch of the world is some variety of the split switch; for places where it is to be constantly used, no doubt the most convenient of any possible form.

It is light, easily adjusted and taken care of, and admits of operating by an interlocking apparatus more readily than any other. It is, however, a fearful danger, if out of order. If not fitted with springs to admit of running through it when mis-set, without breaking the tie-rods, it is likely to be so run through, and to wreck the next train which passes over it; if it is fitted with springs, a little thing may prevent the point from closing, which will as surely cause an accident. Our annals are full of disasters from these causes. The only safe way is to know, by one means or another, that the switch is certainly all right before each train passes. When interlocking signals are used, the arrangements usually provide for locking the point securely in its place before the danger signal can be lowered.

Admitting the advantages of the split switch, where it is in constant use and can be watched over and attended, no switch at all is the best, where it cannot be so thoroughly looked after; and the nearest approach to this is the Wharton safety switch. It is not agreeable to call names, but there is nothing with any other name to class with this. It is not a switch except when it is required for use, for it forms no part of and does not interrupt the main track; it lies inert at the side of the track, untouched by the wheels except when needed to cross them into the siding; consequently it suffers little from wear and tear; it does not admit of rapid shunting, but should be passed over rather slowly. For use in the main tracks at country stations and



at sidings, which are entered by only a small portion of the traffic, it is the safest and most suitable switch yet offered.

There was a time when frogs, switches and signals were better made by each railway company for itself than any which it could buy; but this is no longer. The manufacturing companies devoted to the construction and perfection of these devices have now sufficient patronage to enable them to employ special tools, which will do the work better and cheaper than can be done in ordinary shops. It is therefore unwise for companies, whose shops are too small for their locomotive and car repairs, to encumber them with the manufacture of frogs and switches.

CHARLES PAINE.

#### Statistics of the Even and Broken Joints in the Railroads of the United States.

A few months since a circular was sent from this office to all the different railroads in the country, making inquiries as to a number of facts regarding track, and among them the practice of the roads with regard to even or broken joints. This circular met with a very full response. Statistics have been received in respect to the practice of 143 different roads and combinations of roads, representing a total length of 90,414 miles, out of a total in operation in the United States of 121,592 miles. Three-quarters of the entire mileage is thus represented. The most imperfect returns have come from the New England states, where only 59 per cent. of the mileage is represented, and from the Pacific states and the territories, where only 43 per cent. is represented. Excluding these sections, in which special reasons naturally make it difficult to obtain complete reports, 81,343 miles out of 105,660 is represented. With the exception of a few of the larger lines, which were perhaps made up of such heterogeneous elements as to make it difficult to give any single statement covering their practice, the mileage lacking is nearly all of small, subordinate lines, many of which are practically, although not nominally, allied to the larger lines from which we have reports, and follow their practice.

We begin with this issue the presentation of the results obtained from the responses, by giving the main facts as to the use of even and broken joints.

#### THE PRACTICE AS SHOWN BY THE REPORTS.

The figures in the following tables are for geographical groups of railroads, in fixing which no particular regard was paid to state lines, although each group includes roughly the mileage in the following named states:

Group I.—New England, viz., Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

Group II.—The other North Atlantic States, viz., New York, New Jersey, Pennsylvania, Delaware and Maryland.

Group III.—The states south of the Potomac and the Ohio and east of the Mississippi, with the exception of Kentucky, Tennessee and East Louisiana.

Group IV.—Kentucky, Tennessee, Missouri and the Southwest, including Arkansas, Indian Territory, Louisiana, Texas and New Mexico.

Group V.—States north of the Ohio River, namely, Ohio, Michigan, Indiana and Illinois.

Group VI.—Wisconsin and states further west and north of the last named group, including Wisconsin, Minnesota, Dakota, Iowa, Nebraska and Kansas.

Group VII.—The remaining territories and the states, namely, Montana, Wyoming, Colorado, Arizona, Utah, Nevada, Idaho, California, Oregon and Washington.

The total mileage of railroad in each of these groups at the beginning of 1884 and the mileage reporting below was:

Groups.	Total miles, 1884.	Reporting.	Groups.	Total miles, 1884.	Reporting.
I.	6,231	3,656	V.	26,939	19,731
II.	17,860	14,049	VI.	24,318	21,790
III.	14,626	9,354	VII.	12,533	5,415
IV.	10,087	16,459			
			Total.	121,592	90,414

#### TOTAL, FAVORING EVEN JOINTS.

Group.	Total miles, 1884.	No. reporting.	Use and favor even.	Use broken; favor even.	Use both; favor even.	Total favoring even.
			Roads.	Miles.	Roads.	Miles.
I.	6,231	17	3,656	947	1	258
II.	17,860	30	14,049	1,111	1	171
III.	14,626	30	9,354	1	1	171
IV.	20,087	11	16,459	4	1	5,192
V.	26,939	36	19,731	3,938	3	5,192
VI.	24,318	15	21,790	13,087	11	13,087
VII.	12,533	4	5,415	994	2	994
U. S.	121,592	143	90,414	23,915	2	4,444
Per cent.				26%		5%

#### FAVORING BROKEN JOINTS.

Group.	Use and favor broken.	Use even; favor broken.	Use both; favor broken.	Total favoring broken.
	Roads.	Miles.	Roads.	Miles.
I.	23	1,865	1	128
II.	23	11,092	3	1,108
III.	28	7,183	2	1,154
IV.	3	3,388	1	902
V.	12	5,865	1	1,493
VI.	1	1,610	1	1,610
VII.	1	36	1	4,345
U. S.	71	29,627	5	8,390
Per cent.		33%		9%

UNDECIDED, CONTRADICTIONARY OR AMBIGUOUS.							
Groups.	Using even.		Using broken.		Using both.		Total indefinite.
	Roads.	Miles.	Roads.	Miles.	Roads.	Miles.	
I.	4	425	..	..	..	..	4
II.	1	568	..	..	..	..	1
III.	..	..	1	846	..	..	1
IV.	..	..	1	750	1	6,029	2
V.	1	713	1	117	3	4,779	5
VI.	..	..	..	..	2	7,093	2
VII.	..	..	..	..	..	..	..
U. S.	6	1,706	3	1,713	6	17,901	15
Per cent.		2		2		19%	

From Canada, England, and Germany the reports are as follows:

	Canada.	England and Wales.	Germany.
	Roads.	Roads.	Miles.
Total miles.	7,516	13,052	21,278
No. reporting.	7	5	21,278
Use and favor even.	5	3,560	21,278
Use both; favor even.	1	100	21,278
Total favoring even.	6	3,660	21,278
Use and favor broken.	1	29	1,535
Contradictory or ambiguous.	..	1	314

A curious geographical distribution of practice is shown in the map herewith, and, less exactly, in the tables. In comparing the two it is to be remembered that the subdivision lines of the map cut through the middle of four of the groups of states, the New England, Middle, that north of the Ohio River the extreme northwestern part of that south of the Ohio, and the extreme southeastern part of the south-

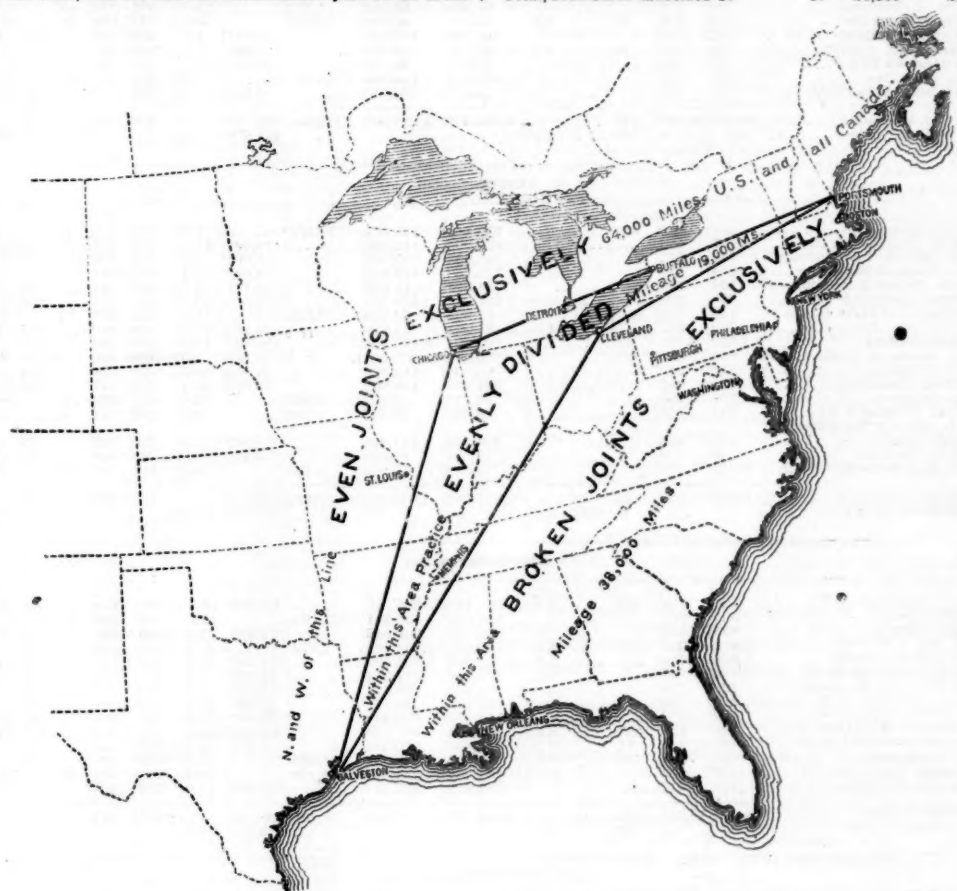
Of the mileage reported, distributing that reported as using both kinds of joints as exactly as possible, there were: Miles now laid with even joints (59 per cent.)..... 53,131 " " " broken " (41 per cent.)..... 37,283

Total reported..... 90,414 Yet the table below shows that the expressions of preference stand as follows:

Totals of Expressions of Preference.				
Corporations.	No.	Per cent.	Mileage.	
			Miles.	Per cent.
Use and favor even	37	26	23,915	26%
Use broken, favor even	2	..	103	..
Use both, favor even	6	..	4,445	5
Total, favoring even joints.	45	30	28,463	31%
Use and favor broken	71	50	29,627	33
Use even, favor broken	5	..	8,390	9
Use both, favor even	7	..	2,611	3
Total favoring broken joints.	83	60	40,628	45
Expressing no preference, or ambiguous	15	10	21,320	23%

Thus the majority in favor of even, of those expressing a preference, is very marked indeed, being almost in the proportion of 45 to 30 as respects mileage, and 2 to 1 as respects individual opinion. With this should be compared the totals from which no definite opinion was obtained, either because it was so qualified and ambiguous that it could not be counted either way, or because a state of doubt was explicitly reported. More fully stated, the element not committed stands as follows:

Totals of Expressions of Doubt.				
	No. Cos.	Per cent.	Miles.	Per cent.
Using even and doubtful.....	6	---	1,706	2
Using broken and doubtful.....	3	---	1,713	2
Using both (but practically, for the roads in this total, nearly all using even) and doubtful.....	6	---	17,901	19%
Total, doubtful or undecided	15	10	21,320	23%



Map Showing Geographical Distribution of Even and Broken Rail-joints.

(Within a margin of error of less than 10 per cent.)

western states, leaving only the Southeastern states, the group west and northwest of Illinois, and the Far Western group untouched. The correctness of the map may be inferred from the fact that in these three subdivisions, the table shows it to be almost literally true, that all the track in the Southeast is laid with broken joints, and all the track in the Northwest with even joints. Of the remainder, it is almost equally true that the map is precisely correct, to this extent at least, that it would not be difficult to substitute wavy or meandering lines, for which the straight lines are equivalents, and which would then make the map literally correct without allowing a margin of 10 per cent., or half that. The principal difficulty would be with the New England states, in which practice throughout its area is pretty evenly divided, with hardly more than a tendency to favor broken joints in the south and even joints in the north.

These statements, it should be carefully noted, refer only to present practice on the track as it now stands. The expressions of preferences, without regard to section, are even more largely in favor of using broken joints than the map shows practice as it now exists to be in favor of even joints. Thus, it appears from the accompanying map and tables that there is:

Track now laid with even joints (61 per cent.)	53,131
" " broken " (39 per cent.)	37,283
Total (592 miles below the actual total)	121,000

Distributing this total with practical exactness, we may say that there are:

Companies.	Per cent.	Miles.	Per cent.
Using broken and doubtful	4	3	4,942
Using even and doubtful	11	7	16,378

From which, combining the two tables just given, we obtain the following as the

Present State of Opinion of those using wholly or mainly Even joints.

Companies.		Mileage.	
No.	Per cent.	Miles.	Per cent.
Favoring even, as now wholly or chiefly in use	43	73	28,363
Using even and favoring a change to broken	5	8%	8,390
Using even wholly or chiefly, and doubtful	11	18%	16,378
Total	59	100	53,131

On the other hand, the following shows:

Present State of Opinion of those using Broken Joints wholly or mainly.

Companies.		Mileage.	
No.	Per cent.	Miles.	Per cent.
Favoring broken, as now wholly or chiefly in use	78	93	32,238
Using broken and favoring a change to even	2	2	103
Using broken wholly or chiefly, and doubtful	4	5	4,042
Total	84	100	37,283

Even this, however, does not give an entirely correct view of the substance of the responses received. Many of them,



## RAILROAD EARNINGS IN OCTOBER.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P. c.
<b>EASTERN ROADS.</b>															
Boston, Hoosac Tun. & West.	87	87				\$ 43,180	\$ 34,486		\$ 10,700		\$ 510	\$ 398		\$ 112	
Eastern	284	284				323,000	330,178		16,082		1,138	1,194		56	
Grand Trunk	2,918	2,794	124		4.4	1,477,137	1,083,592		186,455		500	595		90	
Long Island	354	354				208,989	214,584		5,015		589	606		17	
N. Y., Ont. & West.	373	373				170,300	170,340		50		457	457			
N. Y., Sus. & Western	147	147				89,050	94,043		5,016		53	640		34	
Northern Central	322	322				518,795	590,748		70,953		1,614	1,835		221	
Pennsylvania	2,150	2,070	80		3.9	4,447,544	4,875,345		427,801		2,089	2,355		266	
Philadelphia & Reading	1,580	1,580				2,040,541	3,531,436		590,895		1,885	2,204		319	
Rochester & Pittsburgh	294	294				100,514	75,372		34,142		372	256		116	
West Jersey	195	188	7		3.7	92,850	88,232		4,628		476	469		7	
Total, 11 roads	8,084	8,473	211		2.5	10,433,701	11,677,356		54,536		1,201	1,378		177	
Total inc. or dec.			211						1,243,565					177	13.0
<b>SOUTHERN ROADS.</b>															
Alabama Great Southern	290	290				109,734	112,593		2,859		378	388		10	
Chesapeake & Ohio	517	517				250,868	375,815		115,947		503	727		224	
Eliz. Lex. & Big Sandy	130	130				66,499	70,095		4,196		511	544		33	
Ches. Ohio & Southwest.	399	399				191,402	148,234		13,852		437	372		35	
Cin. N. O. & Tex. Pacific	336	336				237,533	290,333		22,830		707	775		68	
East Tenn., Va. & Ga.	1,098	1,008	90			412,289	455,592		43,303		376	415		39	
Fla. Ry. & Nav. Co.	498	477	21		4.4	79,484	80,523		10,039		160	188		28	
Kentucky Central	254	220	34		15.5	86,370	87,290		90		340	387		57	
Louisville & Nash.	2,065	2,065				1,293,470	1,504,465		210,995		627	729		102	
Mobile & Ohio	528	528				213,207	256,271		43,064		404	485		81	
Nashville, Chattanooga & St. L.	574	554	20		3.6	269,777	301,320		2,417		435	363		8	
N. Orleans & Northeastern	195	130	75		62.5	80,041	12,425		67,606		410	104		306	
Norfolk & Western	503	503				288,405	331,210		42,715		573	658		85	
Rich. & Danville	757	757				429,179	429,834		655		567	568		1	
Char. Col. & Augusta	370	339	31		9.1	96,753	98,205		1,452		261	290		20	
Col. & Greenville	296	296				98,019	86,247		11,772		331	291		40	
Georgia Pacific	313	288	25		8.6	65,990	42,501		23,489		211	148		63	
Virginia Midland	352	352				167,596	176,167		8,571		476	500		24	
Western N. Carolina	210	200	10		5.0	41,513	44,006		2,493		198	220		22	
Shenandoah Valley	249	249				73,857	89,374		15,517		297	356		62	
South Carolina	247	247				157,351	149,294		8,057		637	592		45	
Vicksburg & Meridian	142	142				55,113	64,935		9,822		388	457		69	
Total, 22 roads	10,323	10,107	216		2.1	4,650,470	5,083,329		116,341		450	503		53	
Total inc. or dec.			216						432,859					53	10.6
<b>CENTRAL GROUP.</b>															
Chi. & Eastern Ill.	252	252				155,141	145,021		10,120		616	576		40	
Chi. & West Michigan	419	410	9			126,099	142,134		16,035		307	347		40	
Cin. Ind. St. L. & Chicago	342	342				240,503	249,507		9,004		703	736		27	
Cin., Wash. & Baltimore	294	294				170,252	189,296		19,044		600	667		67	
Cleve. Akron & Columbus	144	144				44,006	49,006		4,000		312	341		29	
Detroit, Lansing & No.	258	260	2		0.8	127,219	169,780		42,561		493	653		160	
Evansville & Terre Haute	146	146				66,808	63,773		3,035		47	305		291	
Flint & Fore Marquette	362	347	15		4.3	186,644	257,779		70,135		516	743		227	
Illinois Central	1,526	1,501	25		1.7	1,023,821	1,183,468		159,647		671	788		117	
Ind., Bloom. & West.	696	696				260,114	270,937		10,823		474	390		16	
Ohio Central	212	212				96,201	118,198		21,997		454	558		104	
Ohio & Mississippi	615	615				381,910	440,990		59,080		621	717		96	
Ohio Southern	130	130				46,819	57,169		9,001		265	261		2	
Peoria, Decatur & Ev.	254	254				66,820	66,227		593		263	261		2	
St. L., Alton & Terre Haute	195	195				134,479	141,408		6,929		690	725		35	
Main Line	138	138				75,577	82,049		6,472		548	595		47	
Bellevue Line	61	61				25,470	19,211		5,359		403	315		88	
Tol. Ann Arbor & N. Mich.	61	61				25,470	19,211		5,359		403	315		88	
Total, 17 roads	6,025	5,987	38		0.6	3,227,559	3,626,054		28,118		530	600		70	
Total inc. or dec.			38						398,495					70	11.0
<b>NORTHWESTERN ROADS.</b>															
Hur., Cedar Rap. & No.	780	714	66		9.4	281,413	306,919		25,506		361	430		69	
Central Iowa	500	500				151,033	130,841		23,192		308	262		40	
Chi. & Alton	850	850				888,739	901,649		12,910		1,046	1,061		15	
Chi., Mil. & St. Paul	4,800	4,610	190		4.1	2,539,000	2,531,128		7,872		530	549		20	
Chi. & Northwestern	3,850	3,735	115		3.0	2,159,000	2,793,992		384,992		1,109	1,339		230	
Chi., St. P., Minn. & O.	1,390	1,335	55		5.3	625,200	674,364		49,164		481	550		68	
Des Moines & Ft. Dodge	138	138				34,859	37,371		2,512		332	272		10	
Green Bay, Win. & St. P.	220	220				29,123	46,132		16,989		132	209		77	
Ill. Central, Iowa lines	402	402				177,300	210,842		33,542		441	524		83	
Marquette, H. & Ont.	138	100	38		38.0	63,144	127,275		64,131		458	1,273		815	
Mil., Lake Shore & West.	400	326	74		22.7	102,800	112,574		9,724		257	345		88	
Mil. & Northern	227	185	42		22.7	50,995	48,160		2,835		225	261		35	
Minneapolis & St. L.	420	420				171,740	151,576		20,170		400	361		48	
Wisconsin Central	440	410	30			140,438	160,114		19,676		319	364		45	
Total, 14 roads	14,455	13,895	560		4.0	7,718,390	8,233,007		54,120		534	594		60	
Total inc. or dec.			560						514,617					60	10.1
<b>ROADS NORTHWEST OF ST. PAUL.</b>															
Canadian Pacific	2,794	1,931	863		45.2	751,000	619,000		132,000		260	321		52	
Northern Pacific	2,453	2,365	88		3.7	1,461,370	1,397,222		64,148		46	596		2	
St. P. & Duluth	227	227				106,481	102,819		3,562		22	718		15	
St. P., Minn. & Manitoba	1,397	1,350	47		3.5	1,008,389	916,881		91,508		732	679		43	
Total, 4 roads	6,871	5,873	998		17.0	3,387,240	3,096,922		291,218		492	527		34	
Total inc. or dec.			998						291,218					34	6.5
<b>SOUTHWESTERN ROADS.</b>															
Fort Worth & Denver	110	110				40,800	43,063		3,063		369	397		28	
Gulf, Colorado & Santa Fe	536	536				207,843	261,436		55,593		388	491		103	
Kan. City, Ft. Scott & Gulf	389	389				212,645	193,415		19,230		546	497		49	
St. L., Ft. Scott & Wichita	182	180	22		13.7	50,492	35,548		14,944		277	222		55	
St. L. & San Francisco	775	750	25		3.3	494,650	361,654		132,996		638	482		156	
Texas & St. Louis	735	735				133,608	114,879		18,729		182	157		25	
Vicksburg, Shreveport & P.	170	73	97		132.9	46,773	27,495		19,278		275	377		102	
Total, 7 roads	2,897	2,753	144		5.2	1,186,641	1,040,092		205,307		400	378		31	
Total inc. or dec.			144						140,549					31	8.2
<b>FAR WESTERN AND PACIFIC ROADS.</b>															
Central Pacific	2,803	3,003	200		6.7	2,152,000	2,496,091		344,091		708	831		83	



## RAILROAD EARNINGS, TEN MONTHS ENDING OCTOBER 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Bos. & N. Y. T. & W.	87	87	...	...	...	\$ 373,382	\$ 281,323	\$ 90,059	\$	31.8	\$ 4,292	\$ 3,257	\$ 1,035	\$	31.8
Eastern	284	284	...	...	...	3,020,976	3,079,967	...	58,991	1.9	10,638	10,845	...	207	1.9
Grand Trunk	2,916	2,794	124	...	4.4	14,317,420	16,030,797	...	1,713,371	10.7	4,907	5,737	...	830	14.5
Long Island	354	354	...	...	...	2,413,116	2,366,743	46,373	...	2.0	6,814	6,683	131	...	2.0
N. Y. Susq. & W.	147	147	...	...	...	849,249	843,049	6,200	...	0.7	5,777	5,735	42	...	0.7
Northern Central	322	322	...	...	...	4,604,803	5,142,885	...	538,082	10.4	14,301	15,972	...	1,671	10.4
Pennsylvania	2,124	2,050	65	...	3.1	40,846,047	42,769,257	...	1,922,610	4.5	19,231	20,772	...	1,541	7.4
Phila. & Reading	1,540	1,280	260	...	21.9	26,102,460	24,347,042	1,755,418	...	7.2	16,732	19,022	...	2,290	12.1
Rochester & Pitts.	294	298	39	...	40.9	955,569	498,977	456,592	...	91.3	3,250	2,390	861	...	35.5
West Jersey	189	185	4	...	2.2	1,153,676	1,071,155	82,521	...	7.7	6,104	5,790	314	...	5.4
Total, 10 roads...	8,270	7,726	550	...	...	94,637,304	96,433,795	2,436,503	4,233,054	...	11,431	12,491	...	1,060	...
Total inc. or dec.	...	...	550	...	7.2	...	...	2,436,503	1,796,401	1.9	...	...	...	1,060	8.5
SOUTHERN ROADS.															
Ala. Gt. Southern	290	290	...	...	...	884,817	853,996	30,821	...	3.6	3,051	2,945	106	...	3.6
Ches. & Ohio	517	517	...	...	...	2,943,302	3,255,102	...	311,800	9.9	5,693	6,296	...	603	9.9
Eliz., Lex. & B. S.	130	130	...	...	...	623,740	603,522	20,218	...	3.3	4,768	4,642	126	...	3.3
Ches. O. & S. W.	399	399	...	...	...	1,093,380	1,063,432	29,948	...	2.8	2,740	2,665	75	...	2.8
Cin. N. O. & Tex. P.	333	336	...	...	...	2,137,442	2,127,083	10,359	...	0.5	6,361	6,331	30	...	0.5
East Tenn. Va. & Ga.	1,098	1,079	19	...	1.8	3,236,639	3,359,064	...	123,025	3.7	2,948	3,114	...	166	5.3
Fia. Ry. & Nav. Co.	487	477	10	...	2.1	7,603,377	740,881	45,156	...	6.1	1,614	1,553	61	...	1.0
Kentucky Central	234	234	...	...	...	763,524	7,710,909	56,355	...	8.0	3,264	3,214	50	...	3.0
Louisville & Nash.	2,065	2,052	13	...	0.6	11,172,468	11,586,830	...	417,132	3.6	5,410	5,648	...	238	4.2
Mobile & Ohio	528	528	...	...	...	1,618,900	1,696,367	...	77,407	4.6	3,066	3,213	...	147	4.6
Nash. Chat. & St. L.	559	554	5	...	0.9	1,965,109	1,913,235	51,874	...	2.7	3,510	3,453	57	...	1.8
N. O. & Nor'west	195	85	110	...	130.4	348,647	81,625	267,022	...	327.1	1,788	960	828	...	86.3
Norfolk & Western	503	467	36	...	7.6	2,219,240	2,308,161	...	88,861	4.0	4,412	4,942	...	530	10.8
Rich. & Danville	757	757	...	...	...	3,135,738	3,146,808	...	...	11.0	4,142	4,157	...	15	0.3
Char. Col. & Aug.	362	339	23	...	6.8	607,877	698,966	...	61,039	6.1	1,679	1,973	...	294	14.8
Col. & Greenville	296	296	...	...	...	516,763	602,109	...	85,408	14.2	1,749	2,034	...	298	14.2
Va. Midland	352	352	...	...	...	1,351,770	1,420,713	...	68,933	4.9	3,840	4,038	...	196	4.9
Western N. C.	207	166	11	...	5.5	362,658	312,121	50,537	...	16.2	1,752	1,502	250	...	10.1
Shenandoah Valley	249	249	...	...	...	631,378	708,464	...	77,066	10.9	2,536	2,845	...	309	10.9
South Carolina	247	245	2	...	0.8	968,264	1,073,280	...	115,016	9.8	3,920	4,381	...	461	10.5
Vicks. & Meridian	142	142	...	...	...	387,830	401,688	...	13,858	3.4	2,731	2,829	...	98	3.4
Total, 21 roads...	9,953	9,710	243	...	...	37,755,673	38,634,306	562,350	1,440,983	...	3,793	3,979	...	186	...
Total inc. or dec.	...	...	243	...	2.5	...	...	562,350	878,633	2.3	...	...	...	186	4.7
CENTRAL GROUP.															
Chi. & Eastern Ill.	252	252	...	...	...	1,283,165	1,366,619	...	83,454	6.1	5,092	5,423	...	321	6.1
Chi. & West Mich.	410	402	8	...	1.9	1,267,370	1,371,805	...	50,435	3.8	3,301	3,214	...	87	3.8
Cin. Ind. St. L. & Chi.	342	342	...	...	...	2,030,321	2,004,165	...	63,844	3.0	5,937	6,123	...	126	3.0
Cin., Wash. & Balt.	284	284	...	...	...	1,458,530	1,609,378	...	150,848	9.4	5,136	5,667	...	531	9.4
Cleve., Akron & Col.	144	144	...	...	...	406,256	448,872	...	42,616	9.5	2,821	3,117	...	296	9.5
Det., Lan. & No.	258	240	18	...	7.5	1,134,610	1,337,070	...	202,460	15.0	4,398	5,571	...	1,173	21.1
Ev. & Terre Haute	146	146	...	...	...	693,811	610,703	23,108	...	3.7	4,341	4,183	158	...	3.7
Flint & Pere Marq.	362	347	15	...	4.3	1,420,717	1,218,639	...	197,906	9.3	5,306	6,106	...	800	13.5
Illinois Central	1,526	1,501	25	...	1.7	8,337,057	8,898,451	...	661,394	7.4	5,398	5,918	...	530	8.3
Ind., Bloom. & W.	696	696	...	...	...	1,227,960	1,286,748	...	260,788	10.5	3,201	3,576	...	375	10.5
Ohio Central	212	212	...	...	...	922,552	906,868	15,684	...	1.7	4,355	4,276	77	...	1.7
Ohio & Mississippi	615	615	...	...	...	3,402,226	3,799,203	...	396,977	10.5	5,532	6,177	...	645	10.5
Ohio Southern	138	138	...	...	...	376,553	296,229	80,324	...	27.2	2,729	2,147	582	...	27.2
Peoria, Dec. & Ev.	254	254	...	...	...	639,639	596,613	43,026	...	7.2	2,518	2,340	169	...	7.2
St. L. Alton & T. H.	195	195	...	...	...	1,101,862	1,216,299	...	114,437	9.4	5,651	6,237	...	586	9.4
Main Line	138	129	9	...	6.9	618,536	693,398	...	61,572	9.4	4,484	5,298	...	814	15.5
Belleville Line	61	61	...	...	...	193,463	190,983	32,420	...	20.1	3,171	2,639	532	...	20.1
Tol., Ann. A. & N. M.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total, 17 roads...	6,033	5,956	77	...	...	27,854,858	29,950,077	194,566	2,259,731	...	4,617	5,027	...	410	...
Total inc. or dec.	...	...	77	...	1.3	...	...	194,566	2,095,169	7.0	...	...	...	410	8.1
NORTHWESTERN ROADS.															
Bur. Ced. Rap. & No.	720	714	6	...	0.8	2,235,876	2,276,644	...	42,708	1.9	3,103	3,150	...	46	2.2
Central Iowa	421	363	58	...	16.1	1,299,103	1,135,229	163,874	...	14.4	3,086	3,127	...	41	1.3
Chi. & Alton	850	850	...	...	...	7,238,001	7,260,204	...	32,203	0.4	8,504	8,541	...	37	0.4
Chi., Mil. & St. P.	4,774	4,533	241	...	5.3	18,944,000	19,121,244	...	177,244	0.9	3,968	4,216	...	248	5.6
Chi. & N. W.	3,844	3,613	231	...	6.4	19,421,486	20,894,965	...	1,473,479	7.1	5,052	5,783	...	731	12.0
Chi., St. P. M. & O.	1,200	1,181	109	...	9.2	4,777,277	4,501,423	275,854	...	6.1	3,703	3,812	...	109	2.2
Des Moines & Ft. D.	198	138	...	...	...	290,892	276,101	14,791	...	5.4	2,108	2,001	107	...	5.4
Green Bay, W. & St. P.	230	220	...	...	...	327,873	323,694	...	58,701	18.0	1,218	1,485	...	267	18.0
Ill. Cent. Iowa Lines	402	402	...	...	...	1,396,348	1,664,425	...	298,077	16.1	3,474	4,140	...	666	16.1
Marquette, H. & O.	121	100	21	...	21.0	770,980	819,777	...	48,790	5.9	6,372	8,198	...	1,826	22.5
Mil. L. S. & W.	382	323	59	...	18.4	916,294	879,192	37,102	...	4.2	2,399	2,722	...	323	11.1
Mil. & Northern	227	185	42	...	22.7	4,848,909	304,870	33,019	...	6.5	1,898	1,134	...	246	11.1
Minneapolis & St. L.	420	420	...	...	...	1,497,029	1,308,435	188,594	...	14.4	3,564	3,115	449	...	14.4
Wisconsin Central	440	440	...	...	...	1,181,336	1,190,127	...	8,791	0.7	2,685	2,703	...	20	0.7
Total, 14 roads...	14,249	13,484	765	...	...	60,652,954	62,049,290	713,708	2,110,143	...	4,257	4,602	...	345	...
Total inc. or dec.	...	...	765	...	5.7	...	...	713,708	1,396,345	2.3	...	...	...	345	7.5
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,358	1,582	776	...	48.6	4,780,900	4,464,002	316,898	...	7.1	2,028	2,822	...	794	28.5
Northern Pacific	2,404	1,824	580	...	35.4	10,734,556	8,016,844	2,717,712	...	31.9	4,358	4,393	...	37	0.8
St. P. & Duluth	227	214	13	...	6.1	1,057,485	1,098,385	...	40,900	3.7	4,651	5,133	...	474	10.5
St. P., Minn. & Man.	1,390	1,296	94	...	7.2	6,570,839	6,849,606	...	278,707	4.1	4,727	5,285	...	558	9.5
Total, 4 roads...	6,439	4,916	1,523	...	...	23,147,840	20,428,837	3,038,670	319,667	...	3,595	4,155	...	590	...
Total inc. or dec.	...	...	1,523	...	31.1	...	...	3,038,670	2,719,003	13.3	...	...	...	590	16.7
SOUTHWESTERN ROADS.															
Ft. Worth & Den.	110	110	...	...	...	395,812	312,246	<							



Purchasing Agent. Mr. H. A. Mitchell, Assistant General Freight Agent, has been appointed Assistant General Passenger Agent also.

**Mississippi & Tennessee.**—At the annual meeting in Memphis, Tenn., Nov. 26, the following directors were chosen: F. M. White, R. P. Neely, A. M. West, C. F. Vance, Monroe Painter, T. W. White, R. T. Wilson, C. P. Huntington and C. H. Bosh. General Walthall and R. P. Lake, of the old board, declined re-election. The directors met afterward and chose the following officers: F. M. White, President; R. T. Wilson, Vice-President; S. H. Lamb, Secretary and Treasurer; M. Burke, Superintendent.

**New York, Lake Erie & Western.**—The following circular has been issued by Mr. S. M. Felton, Jr., General Manager of the New York, Pennsylvania & Ohio:

"Mr. F. E. Rittman having resigned the position of Assistant Treasurer of this company to accept an important position elsewhere, Mr. John A. Sergeant will, until further notice, perform the duties of the office with the title of Cashier. To take effect Dec. 1."

Mr. John H. Hawthorne has been appointed Master Mechanic of the Western and Buffalo divisions, with office in Hornsville, N. Y., in place of George H. Griggs, resigned. Mr. Hawthorne has been for some time General Foreman of the Susquehanna shops.

**Portland & Rochester.**—At the annual meeting in Portland, Dec. 2, the following directors were chosen: Charles McCarthy, Jr., Wm. Putnam, Nathan Webb, George P. Westcott, Portland, Me.; Joseph S. Ricker, Deering, Me.; Stephen J. Young, Brunswick, Me.; Arthur Sewall, Bath, Me.; George C. Lord, Newton, Mass.; Richard J. Olney, Boston.

**South & North Alabama.**—This company has elected J. W. Sloss President; Milton H. Smith, Vice-President; H. M. Bush, Secretary and Treasurer. The Louisville & Nashville Co. controls and works the road.

**St. Catharines & Niagara Central.**—At the annual meeting last week the following directors were chosen: Dr. L. S. Oille, P. Larkin, H. A. King, W. Haight, E. A. Smyth, W. W. Greenwood and R. Wood. At a subsequent meeting of the directors the following officers were elected: L. S. Oille, President; P. Larkin, Vice-President; Richard Wood, Secretary and Treasurer.

**Toledo, Cincinnati & St. Louis.**—The following circular from General Superintendent E. P. Murray is dated Toledo, Dec. 1:

"The following appointments take effect this date: A. R. Snider, General Freight Agent; H. A. Young, Chief Engineer. C. S. Anthony, in addition to that of Auditor, will assume the title and duties of General Passenger and Ticket Agent."

**Tonawanda Valley & Cuba.**—Mr. B. W. Spencer, Receiver, issues the following circular, dated New York, Nov. 29:

"The undersigned, having been appointed, by the Supreme Court, receiver of the railroad and other property of this company hereby assumes charge. The Receiver asks the hearty co-operation of all employees in the difficult task of managing this railroad safely and economically."

"All moneys from whatever source due to the company or its Receiver will be remitted by agents and others receiving the same to the Receiver at New York by U. S. Express. All blanks and way bills before being used must be headed 'B. W. Spencer, Receiver of the Tonawanda Valley & Cuba Railroad,' either stamped thereon or written in ink."

"John V. D. Loomis is hereby appointed Superintendent, with headquarters at Attica, and all employees are directed to report to him for instructions. Further instructions will be issued from time to time, as may be necessary."

**Union Pacific.**—Mr. M. H. Goble having retired from the service of the company, to engage in other business, communications heretofore addressed to the General Purchasing Agent will, until further notice, be sent to the office of S. R. Callaway, General Manager, at Omaha.

**Utah Eastern.**—This company has elected Charles Francis Adams, Jr., President; E. Dickinson, Vice-President and Superintendent; H. McFarland, Secretary. The Union Pacific Co. controls the road, which is not operated at present.

**Vermont Railroad Commission.**—The Governor of Vermont has appointed Gen. Thomas O. Seaver, of Woodstock, Railroad Commissioner under the old law. The new commission law failed to pass.

**Wilmington, Columbia & Augusta.**—At the annual meeting in Wilmington, N. C., Nov. 18, the following were chosen: President, R. R. Bridges; directors, J. T. Barron, George S. Brown, George C. Jenkins, J. P. McKay, B. F. Newcomer, H. B. Plant, Enoch Pratt, H. B. Short, H. Walters, W. T. Walters. The board re-elected W. T. Walters Vice-President; H. Walters, General Manager; J. F. Divine, Superintendent; J. W. Thompson, Secretary and Treasurer.

**Wilmington & Weldon.**—At the annual meeting in Wilmington, Nov. 18, the following were elected: President, R. R. Bridges; directors, N. C.; Directors, A. J. DeRose, R. R. Bridges, Wilmington, N. C.; E. B. Borden, Goldsboro, N. C.; George Howard, Tarboro, N. C.; W. H. Willard, Raleigh, N. C.; J. P. McKay, B. F. Newcomer, H. Walters, W. T. Walters, Baltimore; H. B. Plant, New York. The board re-elected B. F. Newcomer, Vice-President; H. Walters, General Manager; John F. Divine, Superintendent; J. W. Thompson, Secretary and Treasurer.

**Worcester, Nashua & Rochester.**—At the annual meeting in Worcester, Dec. 2, the following directors were chosen: M. V. B. Edgerly, Manchester, N. H.; A. J. Pillsbury, Northwood, N. H.; Frank Jones, Charles A. Sinclair, Portsmouth, N. H.; Charles Holman, Frank A. McKenn, John A. Spaulding, Nashua, N. H.; James P. Cook, Salem, Mass.; J. E. Davitt, F. H. Dewey, Stephen Salisbury, C. L. Turner, Worcester, Mass.; George W. Armstrong, S. T. Fuller, James W. Johnson, Boston, Messrs. Jones, Sinclair, McKenn, Spaulding, Cook, Davitt, Armstrong, Fuller and Johnson are new directors, replacing F. H. Kinnicut, J. E. Smith, E. B. Stoddard, S. Woodward, H. N. Bigelow, A. H. Dunlap, A. M. Norton, J. C. Eastman and J. C. Burley.

#### PERSONAL.

—Mr. M. H. Goble, General Purchasing Agent of the Union Pacific Co., has resigned that position, and will engage in other business.

—Mr. George H. Griggs has resigned his position as Master Mechanic of the Western and Buffalo divisions of the New York, Lake Erie & Western road.

—Mr. Moses Waring who died in Mobile, Ala., Dec. 2, was a prominent and successful merchant of that city, and a director of the Mobile & Ohio Co. for many years.

—Mr. Orrin Hamilton, the oldest conductor on the Boston & Maine road, and one of the oldest in the country, has just

entered upon his 38th consecutive year of service on that road.

—Mr. Charles King, formerly of New York, and a graduate of the City College, but for some time past Assistant Engineer for the Oriental Construction Co. in Mexico, died in Los Angeles, Cal., last week.

—Mr. Dennis B. Strope, General Foreman of the Pittsburgh, Fort Wayne & Chicago round-house at Fort Wayne, Ind., has resigned and will retire from business altogether. Mr. Strope has just completed 30 years of service with the company; he ran the first locomotive into Fort Wayne, when the road was completed to that point.

—Gen. Gershom Mott, of Bordentown, N. J., died very suddenly in New York, Nov. 29. He was well known in New Jersey, and served with credit in the Mexican war and during the late war; for some years past he has been Major General commanding the militia of New Jersey. From 1865 to 1872 General Mott was Paymaster of the Camden & Amboy road, leaving that position to become keeper of the State Prison at Trenton.

—Mr. Samuel R. Stinson, who died at Stillwater, Minn., Nov. 21, was born in New York in 1838, and after working in that city in several capacities entered the service of the Erie Railway Co. In 1859 he went west, and in 1861 was appointed Superintendent of the Dayton & Union Railroad, remaining on that line nearly 10 years. In 1871 he was made General Superintendent of the West Wisconsin road and continued in that position for two years. In 1873 he entered the service of the Standard Oil Co., and remained with that company until 1881, when he again went back to railroad work as General Agent at St. Paul of the St. Paul, Minneapolis & Manitoba road. He afterward served as General Manager of the Northwestern Fuel Co. and as General Superintendent of the St. Paul & Duluth road for a short time. In 1882 he went back to the St. Paul, Minneapolis & Manitoba, but in the following spring left that road to become General Manager of the Northwestern Car & Manufacturing Co., which position he held until his death, having been chosen Vice-President also about a year ago.

—Mr. Samuel Henry Shreve, a noted civil engineer, died in New York, Nov. 28. He had been in failing health for some time. Mr. Shreve was born in Trenton, N. J., in 1829, and graduated from Princeton College in 1848. He studied law but never practiced, however, having abandoned that profession soon after his admission to the bar and taken up that of a civil engineer. Mr. Shreve was identified with rapid transit both in New York and Brooklyn, and with the late Isaac Newton was Engineer of the Rapid Transit Commission, which authorized the construction of the elevated railroads in New York. He was Consulting Engineer of the Metropolitan Elevated road during its construction and was Chief Engineer of the Brooklyn Elevated, now under construction. Mr. Shreve was noted as an author as well as an engineer. Besides a number of papers contributed to the proceedings of various engineering societies, he published some years ago a "Treatise on Bridges and Roofs," which is considered a standard authority in the profession. At the time of his death he had nearly completed an exhaustive treatise on the "Theory of the Arch." He had been for a number of years a member of the American Society of Civil Engineers, always taking an active part in its proceedings.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Eleven months ending Nov. 30:				
	1884.	1883.	Inc. or Dec.	P. c.
Chi., Mil. & St. P.	\$22,527,000	\$21,508,904	D.	\$259,904 1.2
Mil. L. S. & W.	1,010,198	977,982	D.	32,216 3.3
St. L. & San F.	4,298,700	2,755,710	I.	512,981 13.4

Ten months ending Oct. 31:				
	1884.	1883.	Inc. or Dec.	P. c.
L. Rock & Ft. S.	\$420,262	\$11,739	I.	2.8
L. R. M. & T.	270,092	311,193	D.	13.2
Norfolk & West.	2,219,240	2,308,101	D.	88,861 4.0
Net earnings.	963,611	1,087,847	D.	124,236 11.0
Northern Cent.	4,604,903	5,142,885	D.	538,982 10.4
Net earnings.	1,770,767	2,071,438	D.	300,671 14.5
Pennsylvania.	40,546,647	42,708,257	D.	1,922,610 4.5
Net earnings.	15,467,062	16,205,698	D.	827,736 5.1
Phila. & Reading.	26,102,640	24,347,642	I.	1,754,998 7.2
Net earnings.	11,046,730	11,635,390	D.	588,660 5.1
Shenandoah Val.	635,827	712,773	D.	76,946 10.8
Net earnings.	124,419	163,368	D.	38,949 23.9
West Jersey.	1,153,676	1,071,155	I.	82,521 7.7
Net earnings.	467,895	423,023	I.	44,872 10.6

Month of October:				
	1884.	1883.	Inc. or Dec.	P. c.
L. Rock & Ft. S.	\$76,898	\$63,022	I.	13,876 21.9
L. R. M. & T.	42,615	49,518	D.	6,903 13.9
Norfolk & West.	289,495	311,210	D.	21,715 13.0
Net earnings.	155,768	191,307	D.	35,539 23.0
Northern Cent.	519,795	590,748	D.	70,953 12.0
Net earnings.	240,785	286,287	D.	45,502 15.9
Oregon & Cal.	115,593	131,310	D.	15,717 12.0
Net earnings.	44,462	.....	.....	.....
Pennsylvania.	4,447,544	4,875,345	D.	427,801 8.8
Net earnings.	1,927,700	2,216,148	D.	288,448 13.2
Phila. & Reading.	2,940,541	3,551,436	D.	590,895 16.7
Net earnings.	1,281,034	1,900,050	D.	619,016 32.6
Shenandoah Val.	78,305	63,083	I.	15,222 16.1
Net earnings.	26,348	32,356	D.	6,008 18.5
West Jersey.	82,860	88,232	I.	5,372 5.3
Net earnings.	30,812	27,215	I.	3,597 13.3

Month of November:				
	1884.	1883.	Inc. or Dec.	P. c.
Chi., Mil. & St. P.	\$2,308,000	\$2,387,662	D.	\$79,662 3.3
Mil. L. S. & W.	93,905	98,700	D.	4,795 4.8
St. L. & San Fran.	399,800	398,900	I.	900 0.2

Third week in November:				
	1884.	1883.	Inc. or Dec.	P. c.
Bur. C. R. & No.	\$71,554	\$71,904	D.	\$350 0.5
Canadian Pac.	163,000	123,000	I.	40,000 32.5
Chi. & Alton.	202,549	211,718	D.	9,169 4.3
Chi. & East. Ill.	36,717	40,609	D.	3,892 9.6
Chi., St. P. & M.	.....	.....	.....	.....
Cin., Ind., St. L. & O.	128,800	130,000	D.	1,200 0.9
Chi.	47,293	50,543	D.	3,250 6.4
Det., Lan. & No.	24,954	28,144	D.	3,190 11.4
Flint & Pere Mar.	38,957	42,457	D.	3,500 28.0
Illinois Central.	323,400	323,900	D.	500 0.2
Louis. & Nash.	287,479	280,810	I.	6,669 2.4
Marq. H. & Ont.	4,778	8,846	D.	4,068 46.2

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

#### Coal.

Coal tonnages for the week ending Nov. 22 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite.	856,883	712,068	I.	144,217 20.2
Eastern bituminous.	205,122	215,198	D.	10,076 4.7
Coke.	47,659	65,487	D.	17,828 27.2

The anthracite companies will not stop mining the last week in December, as previously arranged. It is understood that the Reading withdrew from the agreement, and the other companies had to follow.

The Southwest Virginia Improvement Co., reports for its mines at Pocahontas, Va., on the Norfolk & Western road, for the ten months ending Oct. 31: Coal mined, 217,949 tons; coal shipped, 140,088 tons; coal coked, 79,148 tons.

The coal tonnage of the Pennsylvania Railroad for the week ending Nov. 22 was:

	Coal.	Coke.	Total.	1883.
Line of road.	153,868	42,506	196,374	222,094
From other lines.	76,409	5,153	81,562	67,449

Total..... 230,277 47,659 277,936 289,543

Total to Nov. 22..... 2,250,452 2,567,483 11,826,035 11,050,925

The decrease for the week was 11,607 tons, or 4.0 per cent.; increase for the year, 776,010 tons, or 7.0 per cent. The coal tonnage of the Chesapeake & Ohio road for the ten months to Oct. 31 was:

	1884.	1883.	Decrease.	P. c.
Coal.	690,974	741,387	50,413	6.8
Coke.	61,345	80,857	19,512	23.3

Total..... 752,319 828,244 75,925 9.2

The decrease was chiefly in the shipments of gas coals, the steam coals showing but little change.

The anthracite coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the eleven months ending Nov. 29 was:

	1884.	1883.	Inc. or Dec.	P. c.
Coal port for shipment.	112,459	121,852	D.	9,393 7.7
S. Amboy.	610,895	547,310	I.	63,585 11.6
Local points on N. J. div.	761,204	765,334	D.	4,130 0.5
Co.'s use.	172,326	148,279	I.	24,047 16.2

Total..... 1,656,884 1,582,775 74,109 4.7

Of the total this year 1,416,486 tons were from the Lehigh, and 240,398 tons from the Wyoming Region.

Actual tonnage passing over the Huntingdon & Broad Top road for the eleven months to Nov. 29 was:

	1884.	1883.	Inc. or Dec.	P. c.
Broad Top coal.	181,185	180,044	I.	541 0.3
Cumberland coal.	376,221	441,176	D.	64,955 14.7

Total..... 557,406 621,220 63,814 10.4

The Broad Top coal is mined on the line; the Cumberland is carried through for the Pennsylvania Railroad.

Cumberland coal tonnages for the eleven months to Nov. 29 are reported by the Cumberland Civilian thus:

	1884.	1883.	Inc. or Dec.	P. c.
Shipments from mines.	1,551,591	1,550,434	I.	1,157 0.07
Cumb. & Penna.	495,825	481,587	I.	14,238 2.9
George's Creek & Cumb.	4,342	296,756	I.	1,291,726 43.7
West Va. Central & Pits.	1,165	4,356	D.	3,191 72.5
Direct to Balt. & Ohio.	.....	.....	.....	.....

Total..... 2,672,063 2,333,123 338,940 14.5

Shipments out of region:

	1884.	1883.	Inc. or Dec.	P. c.
Balt. & Ohio R. R.	1,992,550	1,204,416	I.	728,134 57.6
Bedford Riv., Penn. R. R.	341,485	394,713	D.	53,228 13.4
Ches. & Ohio Canal.	338,028	674,304	D.	336,276 49.9

Total..... 2,672,063 2,333,123 338,940 14.5

Local deliveries are included in the Baltimore & Ohio tonnage. That company has largely increased its tonnage this year, chiefly at the expense of the canal.

#### Grain Movement.

For the week ending Nov. 22 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eleven years:

Northwestern shipments.				
Year.	Northwestern receipts.	Total.	By rail.	By water.
1874.....	2,369,732	858,513	414,044	48,433
1875.....	3,188,546	1,979,619	1,267,584	66,1
1876.....	2,645,154	1,733,909	1,376,025	79,4
1877.....	3,101,359	1,862,943	1,514,900	27,7
1878.....	4,078,731	2,519,174	1,012,737	34,7
1879.....	3,845,635	2,182,321	1,585,928	24,5
1880.....	4,388,767	2,004,368	1,590,003	62,8
1881.....	2,564,428	2,036,895	1,351,275	68,3
1882.....	4,866,926	3,269,096	2,071,628	63,1
1883.....	7,208,602	3,940,250	2,127,292	61,6
1884.....	6,649,068	4,106,290	2,490,118	60,8

Thus the receipts of the Northwestern markets for the week this year were 559,000 bushels less than in the corresponding week of last year, but much more than in any other year. They were also 778,000 bushels more than in the previous week of this year, the increase being chiefly at Chicago and Toledo.

The shipments of these markets were 166,000 bushels more than in the corresponding week of last year, when they were larger than in any previous year. They were a little more than the week before. The rail shipments were slightly larger than last year. The shipments down the Mississippi were but 44,469 bushels. For the time of year the lake shipments keep up unusually well.

The Atlantic receipts for the week were a third more than last year and 9 per cent. more than 1881, but with these exceptions they were the smallest since 1876. They were 395,000 bushels less than in the previous week of this year, but above the average of the receipts since harvest.

About two-thirds of the total Atlantic receipts were at New York. The Montreal receipts have become very small, as usual after navigation is closed, but the Portland receipts have not increased, as they usually do when the Montreal receipts fall off. The Philadelphia receipts were the largest for six weeks; the Boston receipts, with one exception the largest of the year.

Exports from Atlantic ports for this week to Nov. 22 have been:

	1880.	1881.	1882.	1883.
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and over the Kansas City, Springfield & Memphis road from Hoxie to Memphis.

#### New York Canals.

The New York state canals were closed to navigation Dec. 1. The season is a late one, and there was no interruption from ice prior to the date of closing.

The Delaware & Hudson Canal was closed to navigation Nov. 26, and the water drawn off from the higher levels the next day. The season on this canal has been a very poor one for boatmen, on account of the low rate paid for carrying coal.

#### Cotton.

Cotton movement for the three months of the crop year from Sept. 1 to Nov. 28 is reported by the *Commercial and Financial Chronicle* as follows, in bales:

Interior markets:	1884.	1883.	Inc. or Dec.	P. c.
Receipts.....	1,405,429	1,553,148	D. 147,719	9.5
Shipments.....	1,155,511	1,227,740	D. 72,229	5.9
Stock, Nov. 28.....	207,133	374,564	D. 107,431	28.6
Seaports:				
Receipts.....	2,505,451	2,420,284	I. 85,167	3.5
Exports.....	1,392,906	1,239,138	I. 153,858	12.4
Stock, Nov. 28.....	903,062	957,498	D. 53,836	5.6

It must be remembered that a considerable part of the shipments from interior markets reappears in the receipts at the seaports, so that the sum of the receipts at seaports and interior markets is much greater than the actual movement from plantations.

The *Chronicle* says: "In the table below we give the receipts from plantations in another form, and add to them the net overland movement to Nov. 1, and also the takings by Southern spinners to the same date, so as to give substantially the amount of cotton now in sight:

	1884.	1883.	1882.	1881.
Receipts at the ports to Nov. 28.....	2,505,451	2,420,284	2,442,337	2,345,214
Interior stock on Nov. 28 in excess of Sept. 1	249,918	325,408	259,215	347,661
Total receipts from plantations.....	2,755,369	2,745,692	2,701,552	2,692,875
Net overland to Nov. 1.....	98,274	126,859	93,857	126,083
Southern consumption to Nov. 1.....	50,000	59,000	59,900	45,000
Total in sight Nov. 28	2,903,643	2,931,551	2,854,409	2,863,958

Northern spinners' takings to Nov. 28..... 418,737 503,086 500,391 637,740  
 "It will be seen by the above that the decrease in amount in sight to-night, as compared with last year, is 27,908 bales, the increase as compared with 1882 is 49,234 bales, and with 1881, 39,685 bales."

#### Western Passenger Rates.

Several meetings have been held to try and settle the differences among the lines from Chicago to St. Louis and Kansas City, but so far without result, the companies being all unwilling to give way. For a day or two last week the rate from Chicago to St. Louis was cut to 50 cents, but that proved too much for all the lines, and by general consent it was put back to \$2, where it still remains.

#### Passenger Rates.

The passenger war at New York continued without much change until Dec. 2, when the West Shore reduced its Chicago rate from \$9 to \$8.30, and the Erie at once followed. Rates are thoroughly broken up, and the scalpers' offices sell tickets at almost any price that can be named. The Pennsylvania alone continues to maintain its full rate. The New York Central rate to Chicago is still nominally \$10.

From Boston the Boston & Albany and the Fitchburg both make the same rates, \$12 to Chicago and \$16 to St. Louis. By way of the Central Vermont and the Grand Trunk Chicago tickets are sold at \$10.

#### New Hampshire Rates.

The New Hampshire Railroad Commissioners give notice of a series of hearings on the question of rates of fare and freight on the various railroads of the state, at which any of the railroad corporations or their patrons may appear. The act of the Legislature of 1883 establishing a board of railroad commissioners provides in section 4 that it shall be the duty of said board to fix tables of maximum charges for the transportation of passengers and freights upon several railroads operating within the state, and to change the same from time to time, as in judgment of said board public good may require, and said rates shall be binding upon the respective railroads.

#### Nebraska Cattle Traffic.

Arbitrator J. F. Tucker has made known his award of percentages of the Nebraska cattle pool. They are as follows: Chicago, Burlington & Quincy, 30 per cent.; Rock Island, 20½ per cent.; Northwest, 28 per cent.; St. Paul, 20½ per cent.; and Wabash, 6 per cent. The Nebraska cattle traffic began about two months ago, and will be finished for the year about the middle of December. After that, business will be light, and a pool or agreement will not be necessary again until next year.

#### The Chicago Lumber Rate War.

The *Northwestern Lumberman* (Chicago) of Nov. 29 says: "The shippers who have been forwarding lumber heavily on the late 5-cent rate to Missouri River points are now closing up that business. The Wabash road protected its shippers until Monday, and the Alton is understood to have protected its patrons on all the lumber sold on the cut rate, but complaint is made of the Burlington on the ground that it cut its 5-cent rate square off, and gave the yard men no time to get from under. It can be said for the Burlington, however, as a matter of fairness, that its lines became so blocked with lumber that it could not deliver what it had on track in any reasonable length of time, and about the only way out of the jam was to cut the traffic off by raising the rate. If the 5-cent rate had been continued it would have amounted to a complete blockade of movement, and that, of course, had to be avoided, even to the great disappointment of shippers. Just at present the predominant disposition is to praise the Alton freight management to the derogation of the Burlington. The Alton has stuck its limit stake at 10 cents a hundred as the established rate to Missouri River points, and the dealers have faith that the Alton will not allow rates to go higher. But the merchants should not be too confident about this. Complications and combinations are liable to arise that will force the Alton into the declaration of a higher rate. It would doubtless be for the best interest of the lumber trade of this city if the 10-cent rate could be made permanent. It would place all shippers on a more equal footing and preclude, to an important degree, a ruinous competition from rival points. A cut on a 10-cent basis of rates would be a losing business, either on traffic from this city and common points, or from the north in differentials. Anything that can change the order of things that has prevailed for two years past, and cause competition to be in the lumber instead of in freights, will be a beneficial result. So long as handlers of lumber are obliged to watch the vagaries of the freight agents, and constantly change their delivered price lists to conform to the weather-cock fluctuations of railroad rates, prices must be in a constant

state of demoralization. The dealers in lumber should have as much to say about the price of lumber as the railroads, but of late years the railroads have done most of the talking. A leading dealer lately remarked that it was more work to keep track of the freight rate changes than it was to sell lumber; it worried him almost to death by daylight and kept him awake nights. He said that it had come to such a pass that a lumber dealer had to be a thoroughly informed railroad man nowadays, or he would 'get left.'

"An immense amount of lumber was shipped out of the stock in pile during the prevalence of the 5-cent rate. One of the larger houses forwarded nearly 9,000,000 feet up to Nov. 25, and would have made the month's shipments fully 10,000,000 if the 10-cent rate had not been restored. The same house, on three consecutive days, sent out three solid trains of over 50 cars each. This monstrous shipment from a single yard may be taken as an index of the business that has been done during the boom by the majority of the heavier shippers."

#### OLD AND NEW ROADS.

**Allegheny Valley.**—The United States Circuit Court in Pittsburgh has given a decision denying the application of the Pennsylvania Railroad for a remand of the proceedings of that company against the Allegheny Valley Railroad *et al.* to the Common Pleas of Westmoreland County, where it originated. The suit was brought into the United States Court, on a cross-bill filed on behalf of holders of income bonds.

**Baltimore & Ohio.**—A report comes from Baltimore that this company will secure a New York connection "by way of the Bound Brook and Reading road to Philadelphia, and thence to Harrisburg, where it will connect with the South Pennsylvania road to Suippensburg, from which point a branch of six miles will be built to the Western Maryland Road at or near Pen Mary. It will then take the Western Maryland road to Hagerstown and thence by the Washington County road to Weveton, where it will strike the main stem of the Baltimore & Ohio."

**Boston, Hoosac Tunnel & Western.**—Argument was heard last week in the Supreme Court, General Term, at Albany, N. Y., in the matter of the suit of the Troy & Boston against this company on an appeal from a judgment previously entered giving the Boston, Hoosac Tunnel & Western Co. title to the old Albany Northern road, the graded road-bed of which it used from Eagle Bridge to Johnsonville, 14 miles. The Troy & Boston Co. claimed possession of that section of the road, which was graded but never completed, under a lease from the old Albany & Vermont Co., which at one time held possession of the road.

**Boston & Maine and the Eastern.**—At the special meeting held Dec. 2 the Boston & Maine stockholders ratified the amended lease of the Eastern Railroad by a vote of 36,507 shares in favor of 3,008 against it, 30,085 shares not voting.

On the same day the Eastern stockholders met and ratified the amended lease by a vote of 30,669 shares for the lease to 6,055 against it. The lease is thus approved by both companies.

On the same day suit was begun by D. H. Ingraham in the United States Court in Boston to enjoin the Eastern Co. from leasing its road. The Court took the bill and appointed a hearing for Jan. 5 next.

The lease having been approved by both companies, action was taken immediately by their officers, and on the evening of Dec. 2 the following order was issued by Arthur Sewall, President of the Eastern Railroad Co.:

"The Eastern Railroad, its branches and leased roads, having been leased to the Boston & Maine Railroad, and the property having been delivered to the lessee, all officers and employees of the Eastern Railroad Co. will hereafter be under the direction of the Boston & Maine Railroad."

At the same time General Superintendent James T. Furber, of the Boston & Maine, issued the following:

"The Eastern Railroad, together with its leased lines, having been leased by, and all of its property delivered to, the Boston & Maine Railroad, all of its employees will hereafter be in the employ of the Boston & Maine Railroad."

"All rules and regulations now in force on Eastern Railroad will remain in force, and employees will observe all rules and regulations, and will, until further orders, report to the heads of departments of Eastern Railroad as heretofore, and heads of departments will continue to report to the General Manager."

**Buffalo, New York & Philadelphia.**—The stockholders of this company will shortly be asked to subscribe for \$1,500,000 general mortgage bonds at par. If these bonds are taken the company will be able to pay off the floating debt, which now amounts to \$1,480,000, and the company will be in a condition to go on with work on the terminal grounds in Buffalo.

**Canadian Pacific.**—The Superintendent states that the road has got all the supplies, such as rails, fastenings, etc., for the winter north of Lake Superior and the Rocky Mountains. About 20,000 men will be employed in the construction all the winter. The section north of Lake Superior will be completed between now and April 1, and the Rocky Mountain section by Oct. 1 next.

The government of British Columbia has received official information that the Canadian Pacific Railroad Co. has decided to make Coal Harbor at Burrard Inlet the terminus of the road.

**Central, of New Jersey.**—The December dividend, as generally expected, was not paid by the lessee. Further proceedings are pending, as noted elsewhere. Under the terms of the lease no action can be taken until the payment has been in default for 60 days.

The United States Circuit Court has dismissed the complaint in the Dinmore suit to set aside the lease of the road to the Reading Co. It was said that an appeal would be taken to the United States Supreme Court, but thus far no notice has been filed.

**Chicago, Burlington & Quincy.**—At the Aurora shops the Janney coupler is being applied to the last 50 cars of the company's Chicago & Pacific coast fast freight line, to 50 coal dumps and 50 stock cars.

Of the entire force of about 1,500 men employed in the Aurora shops, only about 50 have been laid off, and these temporarily. There is so much work ahead that it is expected that all the regular employees will be kept busy all winter.

**Chicago & Eastern Illinois.**—A dividend of 2 per cent. on the income bonds of this road was paid on and after Dec. 1, 1884. Gross and net earnings have been as follows for September and the three months of the fiscal year to Sept. 30:

	September.	Three months.
	1884.	1883.
Earnings.....	\$153,874	\$158,226
Expenses.....	73,751	62,905
Net earnings.....	\$80,123	\$95,321

For the three months the gross earnings decreased \$4,200,

or 0.9 per cent., and the expenses increased \$19,050, or 9.7 per cent., leaving a decrease of \$23,250, or 9.7 per cent., in net earnings.

**Chicago, Milwaukee & St. Paul.**—This company offers through Blake Brothers & Co., of New York and Boston, \$3,000,000 of its new 5 per cent. terminal bonds, having 30 years to run. An issue of \$5,000,000 of these bonds was recently authorized, secured by a special mortgage on the terminal property of the road in Chicago and Milwaukee. The bonds are offered at 92, ex coupon of Jan. 1, and subscribers are required to pay for them by Jan. 1 next.

**Eastern & Western Air Line.**—Papers have been filed in Pennsylvania and other states showing the consolidation of the companies organized under this name in Pennsylvania, Ohio, Indiana, Illinois and Iowa. The projected line is from a point in Western Pennsylvania to Council Bluffs, with branches to Chicago and St. Louis. The project does not seem at present to have any very substantial foundation.

**Indiana, Alabama & Texas.**—The Mobile, Clarksburg & Evansville has been consolidated with this company. The consolidated company owns no completed road; its projected line is from Evansville, Ind., by way of Clarksburg, Tenn., and Huntsville, Ala., to Mobile.

**Kansas City, Fort Scott & Gulf.**—Work is being pushed rapidly on the new Clinton cut-off, five sections being under contract. It is expected that the grading will be finished from Raymore, the junction with the Pleasant Hill Branch, to Clinton, Mo., 49 miles, this month, and tracklaying will soon be begun.

**Lake Shore & Michigan Southern.**—The statements to the New York Railroad Commission for the quarters ending Sept. 30 and June 30 are as follows:

	Sept. 30.	June 30.
Gross earnings.....	\$3,741,389	\$3,518,378
Operating expenses.....	2,221,916	2,030,211
Net earnings from operation.....	\$1,519,353	\$1,508,167
Gross income from all sources.....	\$1,519,353	\$1,508,167
Deductions from income:		
Interest on funded debt and guaranteed stock proportion for the quarter.....	\$852,742	\$701,092
Taxes, proportion for the quarter.....	135,000	135,000
Rentals, proportion for the quarter.....	111,500	110,272
Total.....	\$1,099,008	\$1,037,264
Net income from all sources.....	\$420,344	\$470,903

The net surplus for the six months from April 1 to Sept. 30 was thus \$801,247, or equal to about 1.8 per cent. on the stock.

The balance sheet as filed Sept. 30 gives the amount of funded debt at \$46,442,000, which is an increase of \$3,500,000 during the quarter. What this increase is for is not explained.

**Lehigh Valley.**—The new station at Wilkes-Barre, Pa., recently opened, is one of the most beautiful in the country. It is 236 ft. long by 60 ft. wide, and has been two years in building. It is of the Swiss style of architecture. Besides the usual accommodations for offices, waiting-rooms, etc., it contains a large hotel and dining-room with all the most modern conveniences and accessories. The interior is finished with a number of natural woods. The covered platform over the tracks is 410 ft. by 24 ft.

**Louisburg & Franklinton.**—Work has been begun on this road, which is to run from Franklinton, N. C., on the Raleigh & Gaston road, east to Louisburg, about 10 miles.

**Midland, of South Carolina.**—A bill is before the South Carolina Legislature to charter this company to build a railroad from Charleston by Columbia and Laurens to Greenville and thence to the North Carolina line. The incorporators of the proposed railroad are Joseph R. Robertson, J. Adger Smythe, William Brannen, Frank E. Taylor, F. W. Wagener, S. A. Durham, F. J. Felzer, George W. Williams, Jr., William A. Courtenay, F. S. Rodors, O. F. Weiters, E. P. Jervey, A. Norden, C. P. Poppenheim, A. F. C. Cramer, C. F. Pankin, G. W. Egan.

**Milwaukee, Lake Shore & Western.**—On the extension of this road the track is now laid to Ironwood, Mich., six miles westward from the late terminus at Bessemer. But 40 miles now remain to complete the road to Ashtabula, Wis., and a considerable part of the grading on this section is finished. The company expects to reach Ashtabula with its track at the end of the year, and to complete connection with the Northern Pacific at that point.

**Natchez, Red River & Texas.**—This company last year completely rebuilt the old Vidalia & Lake Concordia road, which it purchased from Vidalia, La., to Frogmore on Bayou Cocodra, 16 miles. Work is nearly finished on an extension of 9 miles to Trinity on Black River. Two lines have been run for an extension to Alexandria; one crosses Black River below Trinity, and runs along Little River and the south side of Catahoula Lake to Alexandria. Another route takes the north side of Catahoula Lake, passing the White Sulphur Springs and going through a pine timber country.

**New York & Boston Inland.**—This company, which was supposed to be dead, at least for the present, has shown some signs of life by filing a petition in Norfolk Co., Mass., for authority to cross a number of streets, roads and highways in that county with its proposed road. The County Commissioners are to meet Dec. 30, for the purpose of discussing this application.

**New York Central & Hudson River.**—The New York Times of Dec. 4 says: "A meeting of the directors of the New York Central & Hudson River Railroad was held yesterday to go over the business of the road for the fiscal year ending Sept. 30. The result showed 5.21 per cent. earned on the stock. The amount paid in dividends was 7.50 per cent. The report for the last quarter of the year to the State Railroad Commission has been considerably delayed, and in view of the general demoralization of railroad rates and the competition of the New York, West Shore & Buffalo Railway the report of the New York Central has been looked for with a great deal of interest. A criticism passed on the showing made yesterday was that taxes to the amount of \$300,000, and drawbacks and other items to the amount of \$600,000, were omitted from the account. Taking this view, the earnings, as the capital stock of the company is \$90,000,000, would be 1 per cent. less, leaving the actual net earnings applicable to dividends, in general figures, 4.25 per cent. \* \* Incidentally, in connection with the subject of low rates, the business of the road for the month of November came up at the meeting yesterday. A gross decrease of \$400,000 from the same month in 1883 was shown. The tonnage this year was very heavy, but the great difference in rates accounted for the deficiency."



**Norfolk & Western.**—For October and the ten months to Oct. 31 the earnings and expenses of this road were:

	October.		Ten months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$288,495	\$331,210	\$2,219,340	\$2,308,131
Expenses.....	132,727	139,903	1,255,639	1,220,254
Net earnings.....	\$155,768	\$191,307	\$963,701	\$1,087,877
Per cent. of exps.....	46	42	56	53

For the ten months the gross earnings decreased \$88,861, or 4 per cent., and the expenses increased \$35,375, or 3 per cent., the result being a decrease in net earnings of \$124,236, or 11 per cent. The road worked in October was 503 miles in both years; for the ten months, 503 miles this year and 468 miles (average) last year.

**Northern Central.**—This company's statement for October and the ten months ending Oct. 31 is:

	October.		Ten months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$519,795	\$590,748	\$4,604,803	\$5,142,885
Operating exps.....	\$243,647	\$280,786	\$2,519,652	\$2,775,813
Extraordinary exps.....	35,362	23,675	314,384	295,633
Total exps.....	\$279,009	\$304,461	\$2,834,036	\$3,071,446
Net earnings.....	\$240,786	\$286,287	\$1,770,767	\$2,071,439

For the ten months there was a decrease in gross earnings of \$538,032, or 10.4 per cent.; a decrease of \$256,161 in operating expenses and an increase of \$18,751 in extraordinary expenses, making a decrease in total expenses of \$237,410, or 7.7 per cent.; a resulting decrease of \$300,672, or 14.5 per cent. in net earnings.

**Northern Pacific.**—On the Wisconsin Division, track has been laid from last year's terminus at Brule River, Wis., eastward six miles. Tracklaying was also recently begun at Ashland and the rails are reported down for seven miles westward from that point. The grading is substantially completed and the contractors expect to have the rails all down by the end of December, completing connection with the Milwaukee, Lake Shore & Western and the Wisconsin Central at Ashland by the close of the year.

**North Pennsylvania.**—Drexel & Co., of Philadelphia, give notice that the first mortgage bonds due Jan. 1 next will be paid off, interest ceasing on that date. Holders desiring to reinvest in the 7 per cent. general mortgage bonds of the company can do so to a limited extent. They will also cash at par and interest any of the first mortgage bonds presented prior to maturity.

**Oregon & California.**—A special meeting is called to be held in Portland, Or., Dec. 22, for the purposes: 1. Of increasing the number of directors. 2. To authorize the directors to contract for the completion of the road, and to issue bonds for that purpose. 3. To authorize bondholders to vote at all elections, under such regulations as may be made by the board. 4. To authorize the increase of the preferred stock from \$12,000,000 to \$15,000,000. 5. To authorize the increase of the common stock from \$7,000,000 to \$10,000,000. 6. To authorize the board to negotiate for the lease or sale of the company's property to the Central Pacific Co. upon the best terms attainable.

**Oregon Pacific.**—The officers of this road report that the whole line from Yreka Bay, Ore., eastward to Corvallis, 72 miles, is graded, the last of the tunnels having recently been completed. There are three tunnels on the line, in all 2,350 ft. in length. Track has been laid from Yreka Bay east 47 miles and from Corvallis west 9 miles, leaving 16 miles to be completed, which the engineers hope will be done before the end of the year. As soon as this section of the road is finished, work will be begun on the extension from Corvallis to Boise City, Idaho.

**Oregon & Transcontinental Co.**—The directors met in New York, Dec. 2, and extended until Dec. 15 the time for receiving subscriptions from stockholders to the proposed \$10,000,000 loan. It was stated that the subscriptions already received will amount to between \$4,000,000 and \$5,000,000. To meet the complaints of some of the stockholders that better terms might be offered to the latest subscribers, the directors authorized the announcement that the terms would be the same to all without regard to the date of subscriptions. It is understood that the holders of about one-half of the maturing loan are willing to extend their part of it on the terms of the new loan.

**Pennsylvania.**—This company's statement for October, as compared with October, 1883, shows on all lines east of Pittsburgh and Erie a decrease in gross earnings of \$427,801; a decrease in expenses of \$134,353; and a decrease in net earnings of \$293,448. For the ten months to Oct. 31, as compared with last year, the same lines show a decrease in gross earnings of \$1,922,610; a decrease in expenses of \$1,094,874; and a decrease in net earnings of \$827,736. Carrying out these changes we have the following statement:

	October.		Ten months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$4,447,544	\$4,875,345	\$42,780,103	\$42,780,103
Expenses.....	2,524,844	2,659,197	23,475,559	24,567,819
Net earnings.....	\$1,922,700	\$2,216,148	\$19,304,544	\$18,212,284
Per cent. of exps.....	50.7	54.5	50.1	50.1

All lines west of Pittsburgh and Erie for the ten months of 1884 show a deficiency in meeting all liabilities of \$518,086, being a decrease of \$1,681,247, as compared with the corresponding period last year.

**Pennsylvania Company.**—A considerable reduction is to be made in the working force on this company's lines, men being discharged wherever possible. The chief reduction will be in the number of trackmen and shop hands. This course has been taken in preference to a general reduction of wages, which was considered by the officers of the company as an alternative.

**Philadelphia & Reading.**—The Receivers' monthly statement gives the following figures for the earnings of the railroad lines for October and the eleven months of the fiscal year from Dec. 1 to Oct. 31:

	October.		Eleven months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$2,940,541	\$3,331,436	\$28,400,103	\$26,143,014
Expenses.....	1,659,447	1,630,477	16,407,816	15,039,015
Net earnings.....	\$1,281,094	\$1,700,959	\$11,992,287	\$11,104,000
Per cent. of exps.....	50.4	46.2	58.0	52.3

For October there was a decrease of \$590,895, or 16.7 per cent., in gross earnings, and of \$619,865, or 32.6 per cent., in net earnings. For the eleven months the increase in gross earnings was \$2,257,089, or 8.6 per cent., but the decrease in net earnings was \$511,712, or 4.3 per cent. The operations of the leased Central Railroad of New Jersey are in-

cluded for the full year this year, but for five months only (from June 1) last year.

The traffic reported is as follows:

	October.		Eleven months.	
	1884.	1883.	1884.	1883.
Passengers carried.....	2,087,665	2,061,129	22,224,382	16,322,051
Tons merchant se.....	780,484	896,236	8,145,855	7,600,517
Tons coal.....	1,230,970	1,420,277	10,048,639	10,140,502
Tons coal on colliers.....	50,970	47,809	494,602	478,926

The increase in traffic for the ten months was from the New Jersey Central lines, which were reported only from June 1 last year. No separate statement for the Central Railroad is now given.

The earnings of the Philadelphia & Reading Coal & Iron Co. for the same periods was as follows:

	October.		Eleven months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$1,729,672	\$1,873,592	\$14,851,027	\$15,282,274
Expenses.....	1,667,457	1,723,290	15,001,695	14,753,707

Net or deficit, N. \$62,165 N. \$150,302 D. \$150,698 N. \$528,267

Per cent. of exps..... 96.4 92.0 101.0 96.5

For the eleven months the decrease in gross earnings was \$431,247, or 2.8 per cent., and the increase in expenses \$247,988, or 67 per cent., making a total loss of \$679,235, and converting the net earnings last year into a deficit this year.

The coal mined from the company's lands was:

	October.		Eleven months.	
	1884.	1883.	1884.	1883.
By Coal & Iron Co.....	547,762	535,841	4,334,531	4,069,533
By tenants.....	70,215	148,363	679,556	1,358,457
Total.....	617,977	684,204	5,014,087	5,427,990

The total decrease in output for the eleven months was 411,503 tons, or 7.6 per cent., the loss being entirely from tenants' mines, the output mined directly by the company showing a small gain.

The net result for both companies was as follows:

	October.		Eleven months.	
	1884.	1883.	1884.	1883.
Railroad Co.....	\$1,281,094	\$1,873,592	\$11,992,287	\$12,473,999
Coal & Iron Co.....	62,165	150,302	150,698	528,267
Total.....	\$1,343,259	\$2,023,894	\$12,142,985	\$13,002,266

\* Deficit.

The net result for the month shows a decrease of \$708,002, or 34.5 per cent., and for the eleven months a decrease of \$1,220,947, or 9.4 per cent., notwithstanding the addition of the New Jersey Central for half a year this year. The expenses above do not include anything for interest or rentals, the net earnings being the sums from which those charges are to be paid.

A general reduction in wages of all officers and employees took effect Dec. 1. It varied in amount from 10 to 25 per cent. There is much discontent in consequence, especially as this follows a previous reduction. It applies to the employees of the Reading Coal & Iron Co. as well as to those of the railroad.

The petition recently made by the Reading Railroad management to the United States Court for an order on the Receivers to pay the New Jersey Central Railroad December dividend was on Dec. 2 referred by Judge Butler to the Master in the case to report upon the proper action for the Court to take. The dividend can be delayed 60 days without prejudice, under the terms of the lease.

**Pine Bluff & Swan Lake.**—This road is now completed from Rob Roy, Ark., on the Texas & St. Louis road, southeast along the north side of the Arkansas River to Swan Lake, 20 miles; it is of 3 ft. gauge. Extensions from Swan Lake eastward, and from Rob Roy to Little Rock, are projected.

**Pittsburgh, Fort Wayne & Chicago.**—In the suit of the Pennsylvania Railroad Co. against this company the Court has granted the following order, dated Nov. 29: "It is ordered, adjudged and decreed that until the final decree the plaintiffs be and they are hereby authorized to retain out of the first rent payable under said lease, to said bill attached, until guaranteed special stock shall be issued therefor, an amount equal to the disbursements made for improvements upon and addition to the railway of defendant pursuant to approval by defendant, not exceeding the amount of \$1,226,555 and for which guaranteed special stock has not been issued. And that the plaintiffs be and they are hereby authorized from time to time to retain out of such rent such guaranteed special stock as shall be issued therefor such additional amounts as may have been or may hereafter be expended for like improvements and additions, and as shall be approved by the Master or Masters to be appointed by this Court, and upon the terms that such retention shall not be held to effect or avoid the rights of plaintiff under the lease."

"And it is further ordered, adjudged and decreed that an injunction issue restraining the defendant, the Pittsburgh, Fort Wayne & Chicago Co., from attempting in any manner to enforce a forfeiture of the lease aforesaid by reason of such retention. The plaintiffs to give bond to defendant in the sum of \$150,000, with sureties, to be approved by the Court."

**Providence Terminal Facilities.**—The proposed purchase by the city of Providence of real estate to be sold or leased to the various railroads entering the city for the purpose of giving them adequate terminal facilities, was made by the action of the last Legislature of Rhode Island to depend upon the action of a city council to be elected after the passage of the enabling act. The terminal question was made the leading question in the city election last week, which turned almost entirely on that issue, and has resulted in the election of a city council having a very large majority in favor of the proposed improvements. This, it is supposed, finally settles the question, as the new council will undoubtedly take the necessary action.

**Raleigh & Augusta Air Line.**—Work is being pushed rapidly on the 18 miles of road from the Carolina Central crossing at Hamlet, N. C., southward to Cherah, S. C. The bridge over the Pedee River is finished and the grading is nearly all ready for the ties.

**Richmond & Danville.**—The Virginia Legislature has passed a bill giving this company authority to acquire control of and consolidate with itself railroad lines in other states. The object of this legislation is to enable the company to consolidate its various controlled lines so as to enable it to put their finances into a better condition and to reduce the expenses of management.

**Rochester & Pittsburgh.**—It is stated that holders of only 33,850 shares of stock have assented to the plan of reorganization, and it will probably not be carried through. The assent of 50,000 shares was required to make the agreement binding.

**Rome, Watertown & Ogdensburg.**—This company has refused to comply with the order of the New York Railroad Commission directing it to operate the section of the line between Sandy Creek and Pulaski. The Commissioners have notified Attorney-General O'Brien, and action is soon to be brought against the road. The case is the first one of the kind under the law.

This company's statement for the quarter ending Sept. 30 shows gross earnings \$509,465; expenses, \$303,835; net earnings, \$205,630. The charges against income were \$97,866, leaving a net surplus of \$107,764.

**Shenandoah Valley.**—This company's statement for October and the ten months ending Oct. 31 is as follows:

	October.		Ten months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$78,305	\$93,683	\$635,827	\$712,773
Expenses.....	51,937	61,327	511,408	549,405
Net earnings.....	\$26,368	\$32,356	\$124,419	\$163,368
Per cent. of exps.....	66.6	65.2	80.4	77.1

For the ten months the gross earnings decreased \$76,946, or 10.8 per cent., and the expenses \$37,997, or 6.9 per cent., leaving a decrease of \$38,949, or 23.9 per cent., in net earnings.

**Springfield, Shelbyville & Mount Carmel.**—The directors of this projected road met in Shelbyville, Ill., Nov. 26, and decided to have the road surveyed and located at once. Agents were also appointed to secure the right of way for the projected line.

**St. Catharines & Niagara Central.**—At a meeting held last week the stockholders voted to authorize the issue of bonds to the amount of \$20,000 per mile, and to let contracts for the building of the road, work to be begun in the spring. The projected line is from the Canadian end of the Cantilever bridge at Niagara Falls to Toronto, 72 miles, with a spur of 6 miles to Hamilton. The line is everywhere parallel and close to the Grand Trunk. The company has municipal business amounting to \$200,000, and expects to build the road with these and the proceeds of the bonds.

**Texas Trunk.**—This road is advertised to be sold by the United States Marshal for the Northern District of Texas at Dallas, Tex., Jan. 20 next, to satisfy a mortgage made to the International Trust Co. The order of sale was issued by the United States Court under date of Nov. 17. The road was sold under foreclosure about a year ago, but the purchasers have probably failed to meet the conditions, as the new order of sale would seem to indicate.

**Tionesta Valley.**—This road is now completed to Augustville, Pa., on Spring Creek, 8 miles beyond the late terminus at Garfield, and 34 miles from Sheffield Junction on the Philadelphia & Erie road. The road is reported as doing a very good business.

**Tonawanda Valley & Cuba.**—The Metropolitan Trust Co., of New York, as trustee under the first mortgage, has begun a foreclosure suit against this road in the New York Supreme Court, and a receiver has been appointed pending further proceedings. This road is of 3 ft. gauge and extends from Attica, N. Y., to Cuba, 59 miles; it was a consolidation of the Tonawanda Valley and the Tonawanda Valley Extension roads, the former built in 1880 and the latter in 1882. By the last report there were \$113,000 bonds of the original company and \$25,000 consolidated bonds outstanding.

**Union Pacific.**—A circular from this company's general passenger office, issued Nov. 2, says:

"On and after Dec. 1, all of our passenger business to and from points in Oregon and Washington, on the Oregon Railway & Navigation Co.'s lines, and points north and south of Portland, on connecting railways, will be carried via Huntington, terminus of the Oregon Short Line and junction with the Oregon Railway & Navigation Co.'s railway. So far as this business is concerned, the Garrison Route will be practically abandoned on that date. Distance and time are saved by the new route which is direct, broad gauge throughout, and thoroughly equipped for passenger business. The new route is made up as follows:

"The original Union Pacific, from Omaha to Granger, Wyoming, 876 miles; the Oregon Short Line Division, from Granger to Huntington, Oregon, 540 miles; the Oregon Railway & Navigation Company, from Huntington to Portland, 404 miles. Total distance, Omaha to Portland, 1,820 miles. The following comparative table of distances will show our line to be the shortest route, from all travel centres of the east, to Portland: Omaha to Portland via Union Pacific, 1,820 miles; St. Paul to Portland via Northern Pacific, 1,912; Kansas City to Portland via Union Pacific, 2,049; Kansas City to Portland via Northern Pacific, 2,475; Chicago to Portland via Union Pacific, 2,310; Chicago to Portland via Northern Pacific, 2,321; St. Louis to Portland via Union Pacific, 2,223; St. Louis to Portland via Northern Pacific, 2,481.

"A request for a ticket representation via the Oregon Short Line and the Oregon Railway & Navigation Co. was sent to general ticket agents, Oct. 1, 1884. If you find any agents not supplied with this form of tickets, please have them call the attention of their General Ticket Agent to the matter, and also advise this department."

The express train by this route leaving Omaha at 8 p. m. arrives at Portland at 8:10 a. m. on the fifth day—Monday's train reaching Portland Friday morning.

**Vermont Railroad Commission.**—The Vermont Legislature has rejected the bill providing for the establishment of a railroad commission in that state with powers similar to that of the Massachusetts Commission. Vermont has had a railroad commissioner for a number of years, but his powers are very limited and he has usually done nothing but draw his salary.

**Western & Atlantic.**—A bill has been introduced in the Georgia Legislature providing for the sale of this road by the state at a price not less than \$6,000,000. It was referred to the Railroad Committee.

**West Jersey.**—This company's statement for October and the ten months ending Oct. 31 is as follows:

	October.		Ten months.	
	1884.	1883.	1884.	1883.
Earnings.....	\$92,880	\$88,232	\$1,133,676	\$1,071,155
Expenses.....	62,048	61,017	685,781	648,132
Net earnings.....	\$30,832	\$27,215	\$447,895	\$423,023
Per cent. of exps.....	66.8	69.2	59.4	60.5

For ten months this shows an increase in gross earnings of \$82,521, or 7.7 per cent.; an increase in expenses of \$37,649, or 5.8 per cent., and a resulting gain of \$44,872, or 10.6 per cent., in net earnings.

**Wilmington & Weldon.**—At the annual meeting at Wilmington, N. C., Nov. 18, the stockholders voted to authorize the construction of the branch or cut-off line from Wilson, N. C., through Fayetteville to Florence, S. C., which was proposed two or three years ago.

**Worcester, Nashua & Rochester.**—The annual election, on Dec. 2, resulted in an almost complete change, only five of the 15 directors chosen having been in the old board. Some of the names of the new directors seem to indicate that the influence of the Boston & Maine Co. will be felt in the board. As the same company's interest appears in the Portland & Rochester board, also chosen this week, it looks as if the line from Worcester to Portland were hereafter to be controlled by the Boston & Maine, as well as both the lines between Portland and Boston.